



MAGAZINE

PRICE TWOPENCE

OCTOBER 1951



THE I.C.I. MAGAZINE

VOLUME 29 NUMBER 180 OCTOBER 1951

The *I.C.I. Magazine* is published for the interest of all who work in I.C.I., and its contents are contributed largely by people in I.C.I. It is edited by Richard Keane and printed at The Kynoch Press, Birmingham, and is published every month by Imperial Chemical Industries Limited, 26 Dover Street, London, W.1. Telephone: REGent 5067-8. The editor is glad to consider articles for publication, and payment will be made for those accepted.

CONTENTS

The Billingham Underworld	290
Information Notes No. 67	296
Where Mountains stand Sentinel, by D. P. Milburn	301
Personalities in Profile—4	305
Who's going to be second? by Peter Allen	306
I.C.I. News	309
Underground Adventures, by R. M. Wallis	317

Front Cover: A slipper orchid, typical of the exotic wild flowers of Sikkim and northern India.

OUR CONTRIBUTORS

PETER ALLEN was recently appointed Group Director for Paints, Plastics and Leathercloth Divisions, having been chairman of the Plastics Division since May 1948. He has extensive interests outside his work—golf, cricket, railways, foreign travel and foreign stamps.

D. P. MILBURN joined Dyestuffs Division in May 1936. He went to India in 1939 and is now Technical Assistant in the Dyes Department of the Bombay Office of I.C.I. (India) Ltd. He is fond of music and travel.

R. M. WALLIS joined the Chief Engineer's Department of General Chemicals Division in 1949. He studied at Bristol and Cambridge Universities and rowed at Bristol in the University crew. His hobbies are amateur radio and speleology.

THE

BILLINGHAM UNDERWORLD

Eight hundred feet below Billingham, vast reserves of anhydrite—or calcium sulphate, as the chemists call it—are being mined to feed the sulphuric acid and sulphate of ammonia plants which are the foundation of Billingham's fame. Here a visitor to the mine relates his impressions of how this vital raw material is extracted.

Drawn by Arthur Horowicz

BILLINGHAM, as every visitor is told, is the largest chemical works in the world. But how many visitors realise as they tour the vast fertilizer, sulphuric acid and other plants, covering 1000 acres, that the whole of Billingham works is held up by five thousand pillars of rock? Eight hundred feet below the plants they are admiring, electric trains and diesel wagons ply to and fro along 200 miles of criss-cross roads between the pillars. These roads are creeping beyond the works boundaries in every direction as Billingham's miners blast, load, carry and raise the rock to the surface at the rate of 19,000 tons a week to feed the very plants that the visitor sees. For Billingham's plants are spread out above one of Billingham's main raw materials—anhydrite. If we are to visit the great underground empire that is the Billingham mine, we had better know what anhydrite is and why the work of Billingham's miners is so important.

The word anhydrite means "without water," and if we look in the official Billingham booklet we see that anhydrite is "best described as dehydrated gypsum"—which leaves the layman little wiser. In fact, anhydrite is a form of calcium sulphate, and the calcium part of it is wanted for cement and the fertilizer 'Nitro-Chalk,' while the sulphate part goes into sulphate of ammonia (another fertilizer) and sulphuric acid—which is, after all, hydrogen sulphate. This breezy simplification of a series of extremely complicated processes will certainly horrify many a chemist, but better a horrified chemist than a bewildered reader.

Now cement, sulphate of ammonia, 'Nitro-Chalk' and sulphuric acid are four of Billingham's main products, and when we remember that every one of them is playing a vital part in the economy not only of Billingham but of the whole country we begin to see the work of the Billingham miner in its proper perspective. Cement is in short supply; the two fertilizers are essential for growing grass to replace imported animal foods that we have not the money to buy, and sulphuric acid has hit the headlines because of the acute world sulphur shortage. Billingham's unique anhydrite process for making sulphuric acid has suddenly become an important alternative to the much simpler and once cheaper sulphur-burning process now that there is not sufficient sulphur to burn.

M
D

erves of
sts call
cid and
ndation
ne gives
is won.

*The sulphuric acid plant*

And now for the mine. Each miner at the start of his shift—and the visitor too—draws a numbered brass token from the clerk at the pithead office and hands it to the "banksman" as he enters the cage. So if we get lost, our token means that we shall not be forgotten—which is just as well for we are in a strange and confusing new world where the rattle of drills and rumbling of trucks can change very soon into darkness and silence broken only by the occasional distant thunder of a shot being fired. Here are no sweating men hacking sideways at two-foot seams. A broad, well-lit avenue leads from the shaft bottom through a series of air-lock doors to the main roads and railways, off which lead innumerable cavernous passages into the furthest corners of the mine.

The mine is roughly square—at present about a mile square—with avenues about 18 ft. wide and 60 ft. apart traversing it in two directions at right angles. Thus the spaces between the avenues form pillars 42 ft. square—and it is these pillars that hold up Billingham works and prevent it settling on top of us. The height of the roads is decided by the thickness of the seam and varies from 9 to 20 ft., and naturally the roads go uphill and down, following the seam. One of the factors that makes the mine so surprisingly like an underground city is the remarkable flatness of the seam in most places. There are one or two tricky spots where seam and road lurch up or down steep inclines, but most of the slopes are very gentle. Incidentally, there is no fire risk, so we can smoke.

In anhydrite mining there is no pick-and-shovel work—it is all done by gelignite, and the debris (no, that is not the miners' word, but it is none the less apt) is mechanically loaded up and carried to the shaft for raising to the surface. The biggest single blasting operation occurs when two side galleries, one each side of the forward road, are to be started together. This requires 300 lb. of gelignite and will break up 400 tons of anhydrite. We are going to watch this, and in a mood of cautious eagerness we set off with our guide for the scene of operations. This may be anything up to a mile away, and an "electricar" (a battery-driven runabout truck) carries us on the first stage of our journey. A swift, quiet glide in a pneumatic-tyred vehicle along a good wide road nearly a thousand feet below ground is quite an experience.

The last three or four hundred yards are covered on foot, and as we approach the scene of operations the droning throb of the compressed-air drills swells to a deafening rattle. The drillers, who have been drilling the holes in each face for the insertion of the charges, have nearly finished. The shotholes may be anything up to 10 ft. long, and at present they are normally drilled by compressed-air drills mounted on drilling posts braced between the walls (or floor and ceiling) and fed in automatically or by hand-operated screws.

A new system, using a mobile trolley with a hydraulically operated boom carrying automatically fed electric rotary drills, is being developed. This will speed up drilling and also do away with the heavy and, to a slight extent, risky work of

*Drilling a shothole*



*Ramming home
the charge*



Firing the round

setting up the rather cumbersome equipment used at the moment. It is surprising what a neat, square hole can be blasted out by careful attention to drilling and shotfiring. After all, the quite tidy square pillars that the miners leave behind are not trimmed up by hand—they are exactly as the blasting leaves them, except that they have been “scaled” to remove loose pieces of rock.

When the five-man drilling team has finished, they pack up their equipment ready to move off to another face. Drilling to give good results needs skill and care, and in our brief tour we have hardly done justice to the drilling teams of Billingham's mine—but then, if we are to understand everything properly we must work down the mine ourselves for a year or two.

And now it is 10 o'clock—“bait time”—so the drilling team, the shotfitters (who have just arrived) and ourselves retire to the section's “bait hole” for the mid-shift, half-hour break for

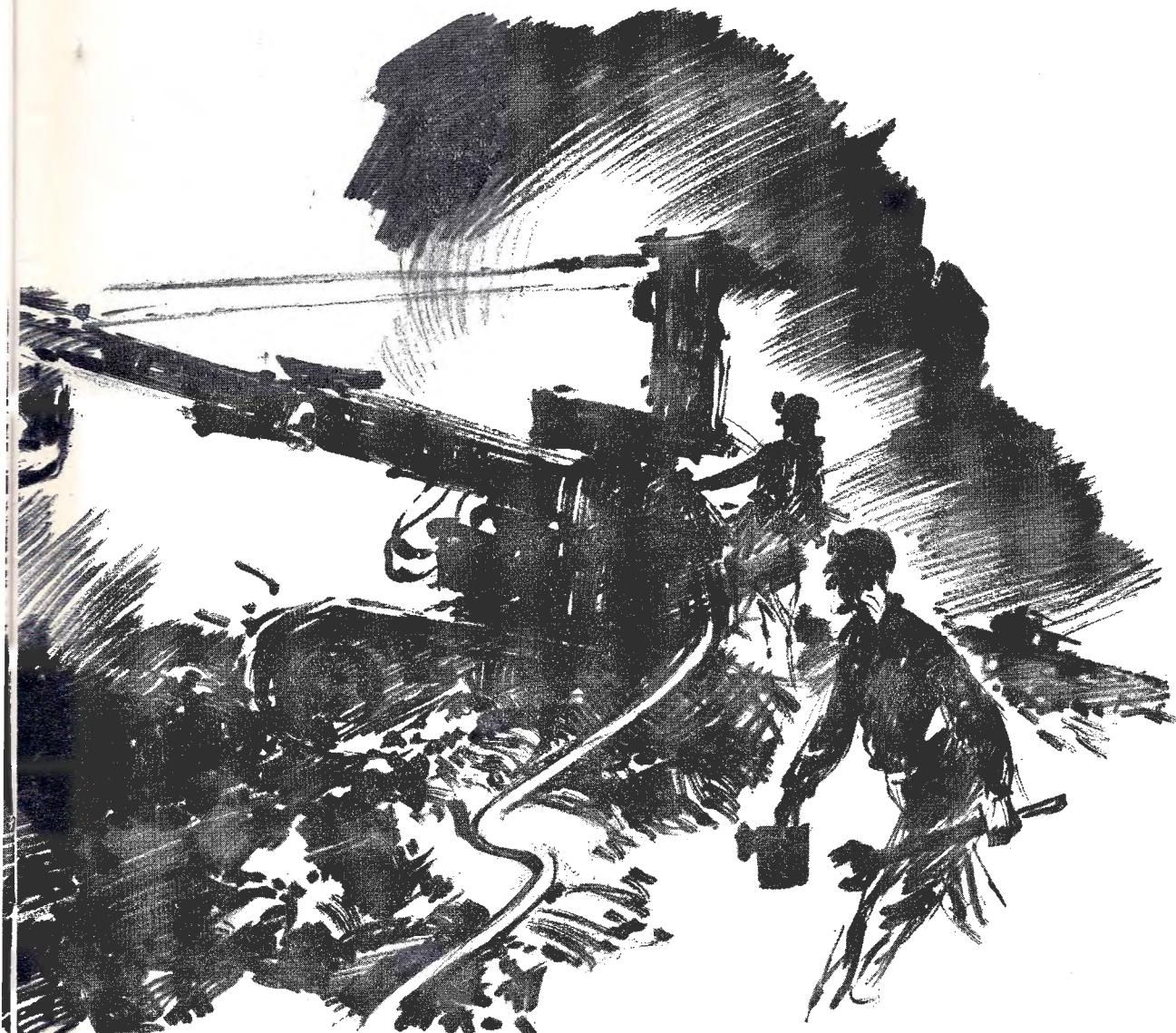


a cup of tea and whatever bait we have brought with us to eat—leek pie, maybe. The bait hole is a convenient dead end walled off with sacking and furnished with tables and benches where the miners can take their half-hour's ease in private and in comfort, if not in luxury. If we have been thinking about that 300 lb. of gelignite—about a bathful of it—and wondering what sort of bang it is going to make, we can stop worrying for half an hour and find out the answers to one or two other little problems.

The main roads, for instance—it must be a lot of work getting them so level and giving them such a good surface? Not at all; there is a full-size bulldozer down here for dealing with that. How did it get down? Why, down the shaft, in pieces, like all the other heavy equipment we have not yet seen. It was assembled down here by the fitters. And if it breaks down it will be repaired down here by the fitters too. What is more, they will soon have a fully equipped under-

ground fitting shop with tiled inspection pits and an overhead crane to help them do it. There is already a battery charging station down here for the electricars, there is a motor room with two sizeable motor generators to provide the D.C. for the main-line locomotive, and there will soon be a diesel-oil filling station for all the new diesel equipment that we have yet to inspect.

And what are the men like that spend their working lives so far from the sun? We shall never have a better chance of meeting them than at bait time. There is perhaps a slight tendency on the part of people who write about miners to make out that they are strange, brooding creatures, not as other men. This is all nonsense. Miners are men first and miners afterwards, and they no more have common characteristics than a group of directors or a group of office boys. There are short, fat, jolly miners and tall, thin, gloomy miners. If they have anything in common it is a certain deliberateness of



MECHANICAL LOADING. *The Joy loader scoops up the anhydrite brought down by blasting, and its conveyor chain carries the stone along a boom and into a waiting truck.*

movement and a sense of responsibility towards each other, because even in a very safe mine like Billingham every miner to some extent, however small, may carry the lives of his mates in his hands. But it would be a great mistake to think that because they all wear hard hats and have white dust on their eyebrows they are all alike.

When bait time is over, the drilling section moves off to another face and the shotfirer and his mate get to work. This particular shotfirer happens to be George Winspear, and he is getting his name into this article because he is *Magazine* correspondent for the mine, and we journalists stick together. George is a cheerful, matter-of-fact character looking a lot younger than his fifty-odd years, over twenty of which have been spent shotfiring at Billingham. The trouble about shotfiring, he explains, is that if you make a mistake you cannot cover it up or blame anyone else. If a round misfires everyone has a very anxious time, and they know it's your fault.

When all the charges have been plugged, George and his mate wire up the detonators. Then he unwinds a coil of rather thicker wire away from the face and round two corners, connects up the detonators and tests the circuit with a galvanometer for continuity. Finally he and his mate go off into the darkness, waving their acetylene lamps and calling their echoing warning "Firing in Number Six Level!" for all the world like some medieval wardens of a castle touring the dungeons before the Last Post.

The rattle of drills at a nearby face is silenced as the drillers move away to safety, and there is an expectant quietness, broken only by the gentle hiss of compressed air seeping from some air line, as George unlocks his exploder. The mine seems to get suddenly deeper and darker. He connects the wires to the exploder and winds a little handle to charge up the condenser. George turns to us. "Are you ready?" he asks, as if he were going to make a cup of tea rather than let off a bang that will shatter 400 tons of rock into a heap of stones. We are anything but ready, but we screw ourselves up to the pitch of expectancy a parachutist keeps for his first jump and say we are, so George presses the button.

There is no way of describing what it feels like to be near a large round when it is fired. It is as if a furious giant had slammed the gates of heaven itself. A vicious sheet of sound whips through your whole body, then for many seconds rumbling echoes roll off into distant corridors of the mine, then there are little sounds of falling stones, and then it is quiet.

"Ah," says George, "a nice *mellow* bang. That means we have been specially successful." And so they have. After the gas has cleared and the dust settled we can see two neat square caves with a pile of stones—just the right size—heaped up in the roadway between them.

The next step is to get the stone to the shaft bottom, and at Billingham this is done in two ways. The old way uses machines called scraper-loaders, designed and built at Billingham specially for the job. Until very recently this was the standard method, and the whole mine was organised and planned to suit it. A double-track electric railway runs straight along the middle of the mine at right angles to the main slope of the seam. Little open wagons or "tubs" (holding just over a ton each) can be hauled up and down cross-slopes by means of permanently installed electric haulage engines, and there are auxiliary portable compressed-air winches or "tuggers" for pulling the tubs round corners to the face and back to the main incline. Rail track is laid right up to the working face.

This rail method of loading and carrying the rock has served Billingham faithfully for over twenty years, but its days are numbered. Two pieces of equipment—the "Joy" loader and the 12-ton diesel truck, are making it possible to do away with the whole complicated set-up of rail tracks, hauling engines, tuggers, cables, scraper-loaders, overhead wires and all the rest of it—and incidentally to do away with the ever-present possibility of accidents and "dangerous occurrences" that the use of all this equipment implies.

The Joy loader consists of a caterpillar type of chassis carrying a conveyor-type elevator on an overhung boom. It looks somewhat like a small and very sturdy version of that type of fire engine that carries an extensible ladder over it. The conveyor corresponds to the ladder and can be elevated and traversed hydraulically in much the same way.

At the bottom of the conveyor is a spade-like platform which carries two metal arms that can imitate almost exactly the scooping action of, say, a gambler scooping his chips off the table with both hands. When the shotfirers have brought down the rock, the Joy loader driver simply backs his machine up to the pile of stone, being closely followed by a 12-ton diesel lorry which is backed under the front end of the elevator boom.

Then the loader driver switches on the scooping mechanism and the two metal hands greedily scoop the stone on to the bottom of the conveyor. The whole loader is backed into the pile as the stone is cleared and the 12-ton truck follows it up so as to keep always under the steady stream of stone dropping from the front of the conveyor.

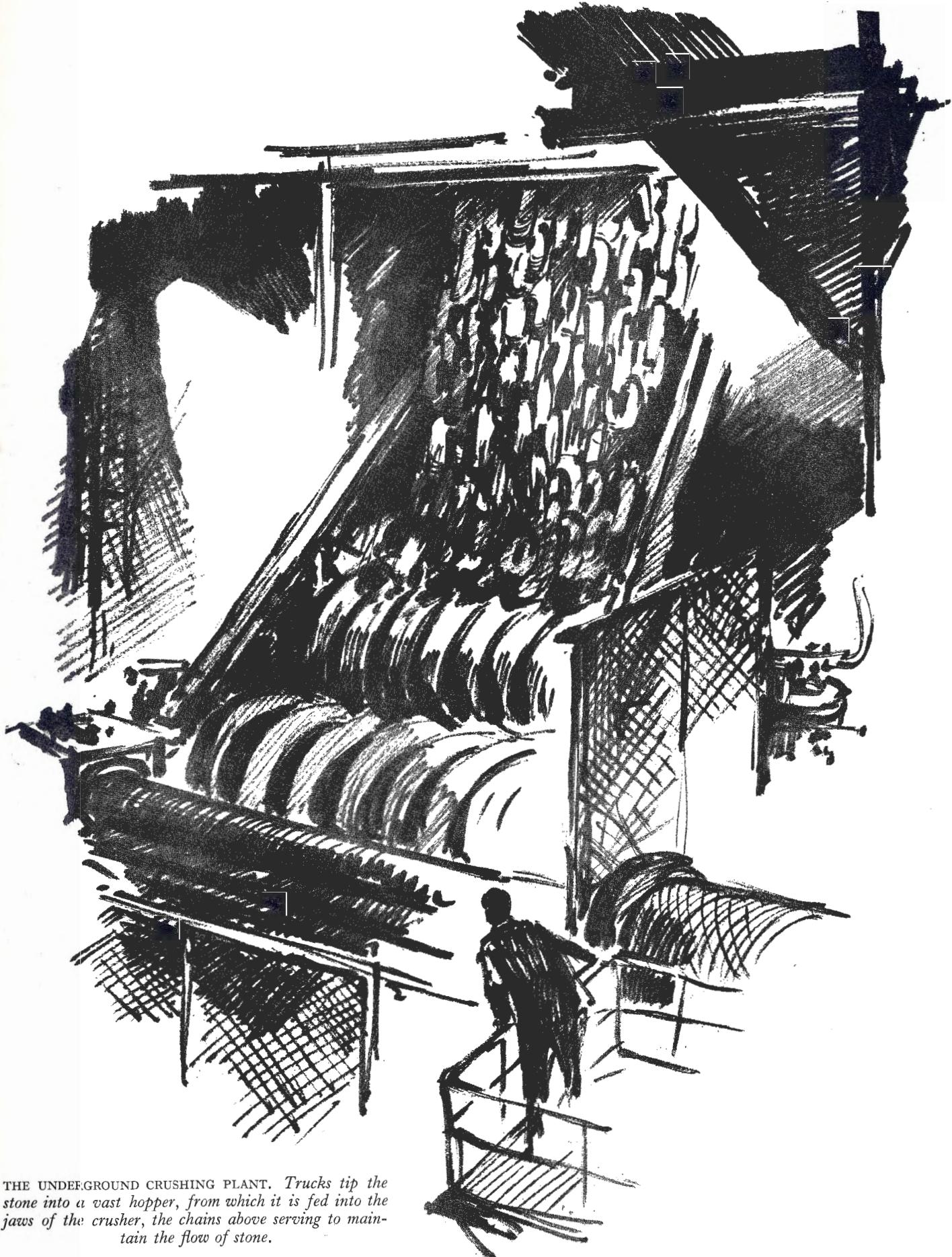
The full time taken to load up the truck depends on how convenient the working conditions are, but the Joy loader itself can scoop up well over three and a half tons a minute when it is once in position.

When the 12-ton truck is full it is driven off to the shaft, and as we drive off with it we wonder how the driver is going to get rid of his load. He cannot use the tipper that discharges the tubs, and in any case he cannot discharge direct into a hoist skip, as his load is three times too big for it. The answer to this problem developed by Billingham mine engineers is as bold and fascinating as it is simple.

The driver runs his truck not to the shaft bottom, but to a broad, well-lit cavern nearly a quarter of a mile from it. He crosses a little iron bridge and parks just beyond it. At this point, convenient to his hand as he sits in the driving seat, there is a control lever mounted on a post set in the side of the road. He presses the lever, and, as if he had said "open sesame" in some Aladdin's cave, there is a hiss of air and a section of the road hinges open like a drawbridge just behind his truck. He tips the truck, and twelve tons of rock disappears into what might be described as the bowels of the earth. Then he raises the lever, the drawbridge sinks back, and he drives off to collect another load.

We have just time for a look at "the works." In a vast pit under the floor there has been installed a complete underground crushing plant, with storage hoppers and dust extractors. The anhydrite, crushed to a size convenient for handling, travels by a quarter-mile conveyor belt to the shaft bottom, where the hoist skips can be loaded, so to speak, in comfort.

Now our brief underground tour is over, so we return, through the air-lock doors to the bottom of the other shaft where a cage is waiting. The onsetter hands us back our tokens, fastens the gate, signals to the winding engineman, and up we go to meet the sky once again.



THE UNDERGROUND CRUSHING PLANT. Trucks tip the stone into a vast hopper, from which it is fed into the jaws of the crusher, the chains above serving to maintain the flow of stone.

Information Notes

IN SPAIN TODAY

By G. G. Fowler (Managing Director, S.A. Azamón)

SPAIN is a country of extremes—of extremes in the manner of living no less than in the climate. Her industries, for example, range from very primitive husbandry comprising Roman-style ploughs, hand-sowing and winnowing in the wind (there is an almost pathetic lack of tractors and combines) to advanced petroleum refineries, hydro-electric power stations and fertilizer factories. Her transport system too jumps from the ultra-modern Talgo "snake" train to the most antiquated rolling stock.

But do not let it be thought that the peasant is lazy—far from it, for you will see him hard at it in the fields at sunup and at sundown, Sundays included, but not like "mad dogs and Englishmen out in the midday sun." The climate too is extreme in this peninsula, so aptly likened to an ox-hide stretched out to dry. The northern strip is fertile and lush green, then comes the arid Castilian plain with its lack of top soil, followed by the hot Andalusian olive country, and bordered to the east by the intensive market-garden districts of the Levante. To be complete we should also add in the sub-tropical Canary Islands, which politically are an integral part of Spain, though some 1400 miles away, being two of the fifty provinces into which she is divided.

It is truly said that one of Spain's main exports is sun, and either the tourist comes to get it or it is exported all through the year as oranges, Canary Island bananas, tomatoes, Levante onions, apricots, melons, grapes and olive oil, and topped perhaps by bottled sunlight as sherry or Malaga or Rioja wines. Strangely enough, the biggest export of Spanish wine is often to France, where it is "educated" and then sold as French!

Among Spain's other traditional exports there are pyrites (much in demand today as a source of sulphur), iron ore, mercury (by far the richest mines in the world), and potash. Her main market outlet, and equally traditional, is the United Kingdom. This should make it possible for a lot of reciprocal trade to be done with the United Kingdom, but unfortunately this lately has been far from satisfactory.

The main reason for this state of affairs is that Spain, hard up for foreign currency, has taken very full advantage of the transferability of sterling to import what she can in sterling of essential raw materials such as cotton, petroleum, rubber and jute. A contributory reason may be the present official animosity towards Britain, where the (to Spain) inconsistent stand taken by Britain and France towards, say, Italy as compared with Spain is steadily played up in the press. Gibraltar is also an official sore point, but by the same token is another valuable Spanish "export," for every day a stream of Spanish day workers crosses over the line into Gibraltar to gain very good wages indeed. It would be a sorry day indeed for that part of Andalusia with the consequent unemployment were Gibraltar to be handed back.

While the present regime has not been able to keep sharp inflation away from Spain, it apparently has not done as badly as some other countries. Tourists, now that a favourable rate of exchange is allowed them, find Spain comparatively reasonable.

Unfortunately for the white-collar and artisan classes, wages have not kept step with this inflation over the years, and most people have had to resort to taking two or three jobs in order to make ends meet. As a consequence, such things as require individual hand labour or attention are often found to be quite cheap when compared with similar articles made in countries where higher standards of living obtain. On the other hand, the rich appear to be very rich indeed and somehow seem to be able in this day and age to preserve some of the customs and modes of life of feudal times.

The Spanish daily way of life, too, is somewhat extreme—with lunch at 2.30 p.m., supper at 10.30 p.m. and the cinema finishing after 1.30 a.m. Indeed, in summer even the veriest toddlers never get to bed till 2 a.m. In town by far the greater majority live in flats, and Madrid has very few suburban districts, for the outrageous expense of heating individual houses in winter discourages their use by those who otherwise would choose to live in a house with a garden. There is thus a sharp line of demarcation where town ends and country begins.

I.C.I. interests in Spain are looked after by S.A. Azamón, a wholly owned subsidiary. The name, a portmanteau one, comes from what was the main business contemplated when founded in 1925, that is nitrogenous fertilizers. The accent has changed with the years, and dyestuffs, Lightning Fasteners, pharmaceuticals, general chemicals and plastics are also today among the main products sold. Azamón's head office is in Madrid, with a big dyestuffs sales organisation based on the Barcelona office, a modern Lightning Fasteners factory at Rubí near Barcelona, pharmaceutical laboratories also in Barcelona, warehouses and an office in Valencia and the Levante, and a small office lately opened in the Canary Islands. There is much rivalry between Madrid, the elegant capital, and fair Barcelona, the Manchester of Spain, each with one and a half million inhabitants of the total for Spain of twenty-eight millions.

After several lean years, when even the climate with near droughts was more than usually against her, Spain is now reaping bumper crops of wheat and other cereals, and very good harvests are expected. This, together with American financial aid and the appointment of businesslike men to some of the posts in the new Cabinet, may mean that a good time is in the offing for Spain. If peace can be preserved and a more liberal import policy pursued the prospects for the sale of I.C.I. goods in Spain are encouraging.

METALS UNDER TEST

Contributed by Metals Division

The I.C.I. Creep Test Station at Witton, Birmingham, embodies the latest scientific advances for establishing the reaction of metals and alloys to prolonged stress. The station is being officially opened in the New Year.

THE value of metals in everyday life is so obvious as to require no comment. In whichever direction we turn our eyes—in our homes, in the streets, in our workplaces, on the sea or in the air—we find that most things include metal in their make-up. We are, however, so apt to take all the things we see and use for granted that we rarely pause to reflect on the many difficult problems encountered in harnessing the natural elements of the earth, with all their inherent mysteries, to the needs of man.

For example, not many weeks ago our newspapers told us that a jet plane, made in Britain and piloted by a Briton, had crossed the Atlantic in a little over four hours. One of the components which go into the construction of a jet engine—a turbine—functions much like a simple waterwheel enclosed within a metal cover. Instead of water, hot gases impinge on the wheel, and in consequence the blades become red hot. As the wheel spins round the tip of the blades approach a speed of 800 miles an hour, and forces are developed which tend to pull the blades away from the hub of the wheel.

When such forces, provided they are not too great, are applied to a piece of metal at ordinary room temperatures, the metal will first stretch until it is able to resist and counter-balance the pull, to all intents and purposes for ever. But if

the force is applied to metal when it is red hot—like the turbine blade—then it will continue to stretch until at last it breaks, the length of time before this happens being, of course, dependent upon the strength of the pull.

Generally speaking, fracture will ultimately occur—perhaps after years of service—however small the value of the applied force, if the pull is combined with the presence of high temperatures.

In our example, the higher the working temperature the more efficient the engine, but unfortunately the amount of stretch increases with the working temperature. Again, the smaller the gap between the end of the blade and the inside of the circular cover the more efficient is the engine, and a clearance of about twice the thickness of a human hair is often employed. So, since a certain amount of permanent extension of the blades occurs during any run, however short, the engineer who designs these power units needs to know how long the engine can run before stretching results in the blades fouling the inside of the fixed casing.

This illustration has been chosen because it clearly indicates the type of problem associated with using metals subjected to force at high temperatures. The continual stretching—a phenomenon which scientists have aptly named “creep”—is



Testing room of the Creep Test Station

the important point to remember. The same thing occurs when superheated steam or hot gases are passed under high pressure through pipe systems such as those installed in power stations. Here the diameter of the pipe continually increases, and the engineer has to consider this important factor when designing the system.

Although, under service conditions, the amount of extension which occurs in one day, or for that matter one month, is exceedingly small, the fact remains that hour by hour slow and relentless stretching goes on. Turbine engineers design on the basis that an inch length of the material they employ will only stretch 88 millionths of an inch in one year. A corresponding figure used by engineers concerned with the design of oil or steam plant is less than one-thousandth of an inch—about half the thickness of a hair.

Those engaged in the production of metals must be in a position to supply engineers with information regarding the amount of extension under specified force and temperature conditions. (Information of this nature is particularly valuable, for instance, to the Company's engineers responsible for designing chemical manufacturing plant, as at Billingham, where conditions involving high temperatures and pressures

obtain.) Moreover, metallurgists developing alloys for high-temperature service can only assess their relative merits by reference to their creep behaviour.

To fulfil all these requirements it was decided to erect and equip a special laboratory at Witton—site of Metals Division's largest factory—known as the Creep Test Station. In this building sixty special testing units are installed in which specimens of various metals—both ferrous and non-ferrous—can be mounted and maintained for long periods of time at any temperature up to, or even beyond, 1000° C., while at the same time a constant pull can be applied.

It must be remembered that one test may continue for a year or more—in certain American laboratories tests have been proceeding for as long as ten years. Those parts of the instruments outside the furnace must therefore be kept at a constant temperature. To achieve this the building is windowless, and a specially designed air-conditioning plant is installed to keep the test-room temperature constant at 67° F. Vibration can also introduce unwanted factors into the measurement of extension, and to minimise this the testing units stand on large concrete rafts separated from the building itself by air gaps and cork linings.

SULPHURIC ACID FROM ABROAD

By Dr. F. H. Peakin (Central Purchasing Dept.)

THE importance of a vital industrial material such as sulphuric acid is forcibly brought home to the public when it becomes scarce, and the shortage of sulphur and sulphuric acid has for this reason been much in the news recently.

The causes of the shortage and its serious effects were the subject of an article by Mr. W. A. M. Edwards in the March number of the *Magazine*. Directly or indirectly, virtually every industry in the country is vulnerable. Last autumn Central Purchasing Department decided that steps must be taken at once to import sulphuric acid from the Continent. The scarcity of acid was not severe there because it is made chiefly from pyrites, which is plentiful in Europe, and not from American sulphur, which is scarce.

Formidable transport problems had to be solved. Being a cheap article, sulphuric acid is usually manufactured near to where it is used and is not transported across the sea in large quantities. It can be carried in steel drums and glass carboys, and these could be brought over by ship, but supplies of these containers are scarce, and moreover this would be an expensive way of moving very large amounts of acid. It was at once evident that the only practicable method was bulk shipment in tank ships.

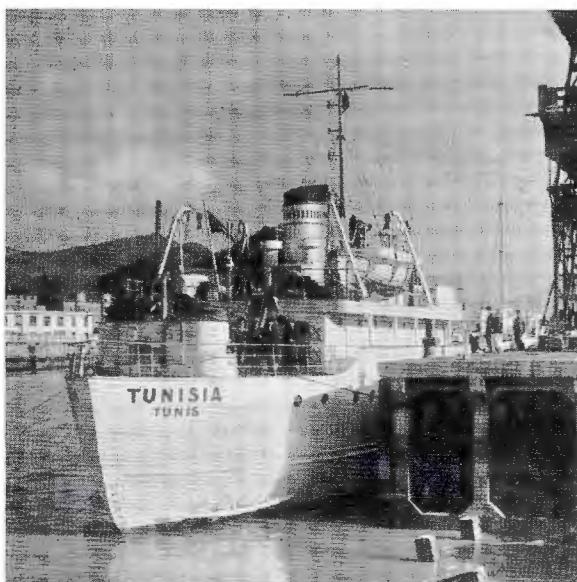
Acid is generally thought of as something which will quickly eat into a metal like iron. Paradoxically, the stronger the sulphuric acid the less effect it has on iron

and steel, and it is quite customary to store and transport sulphuric acid in steel tanks.

But where were the sea-going tankers to come from? Oil tankers would be of unsuitable design, and in any case nearly all of them would be too big. The only tanker in Europe known to be specially designed for acid had left for use in Australian waters. Our chartering agents, B. E. Moors & Co., were quickly in touch with several ships fitted with tanks used for carrying such cargoes as wine, olive oil and linseed oil in the Mediterranean. By improvisation these could be made suitable for carrying sulphuric acid, and centrifugal pumps for discharging it were fitted in the vessels which required them. In this way a fleet of five tankers was chartered by I.C.I. with an aggregate carrying capacity of nearly 3000 tons of acid.

While this fleet was being collected, contracts were being arranged in France and Spain for the supply of acid at Atlantic ports.

It was soon evident that several other British firms were making enquiries for acid and for tank ships. Nearly all of them agreed to entrust their imports to I.C.I., and the operation grew in size and in its importance to British industry. Acid was now to be imported for some of I.C.I.'s own factories, for those of some of its suppliers of raw materials, and for many other companies who needed acid.



One of the specially chartered ships used to import sulphuric acid

There were other problems to be solved. When a tanker arrives in this country containing perhaps nearly a thousand tons of acid she has to be discharged in a day, or in two days at most, for ships are expensive to keep waiting. There are no British ports with storage tanks conveniently waiting at the quayside to take acid in such amounts. The only other way to discharge the ships quickly is to have enough road or rail tanks assembled to receive the acid and take it to the factories where it was needed. Some of the road tankers might have to make several journeys in a day to help to complete the discharge. The greater part of the imported acid is being brought into Birkenhead, where the great experience of I.C.I.'s General Chemicals Division is applied to discharge ships, arrange transport and despatch it to consuming factories. Special equipment was rapidly erected to deal safely and promptly with cargoes of acid.

Some of the acid was not of a quality and strength which could be used for the purpose intended. Luckily it was possible to arrange for this acid to be used for fertilizer manufacture, for which a high quality is not necessary, and better-quality acid was so released for other uses.

For short periods additional tankers have been chartered to increase the flow of acid. From the time the operation began at the end of March until the end of August these tankers had made 43 voyages from the Continent to British ports, and no

less than twenty thousand tons had been brought into the country by I.C.I. ships.

I.C.I. has not been the only firm to organise imports of acid. Substantial amounts have been brought over from the Continent in rail tank wagons by the train ferries, and since the first I.C.I. tanker was berthed in the Manchester Ship Canal other tankers have made the journey to this country. However, I.C.I.'s imports comprise the greater part of the total.

The quantity of acid imported is very small (perhaps only 3%) compared with British production. Nevertheless, for individual firms imported supplies are of vital importance and it is noteworthy that there is now enough imported acid for any firm able to afford its higher price.

How long will these imports go on? From the start the operation was regarded as a temporary measure to avoid the worst consequences of an acid shortage. Imported acid, however, is two and a half or three times the price of home-produced acid, and not every user can afford to pay such a high price. Strenuous measures are being taken by the British sulphuric acid industry to make itself less dependent on supplies of American sulphur, both by converting acid plants to use other raw materials and by seeking to obtain supplies of sulphur from other parts of the world. Until these measures are effective it will probably be necessary to go on importing acid from the Continent for most of next year.

B R O N Z E P I G M E N T S

Contributed by Dyestuffs Division

One of the quirks of nature is the bronze sheen that can radiate from a surface which on closer examination will be seen to have a different colour. Here a Dyestuffs Division expert explains how this paradoxical phenomenon comes about.

WHEN you look from an angle at pigmented articles such as coloured plastic materials, coloured posters and book illustrations, or coloured enamelled finishes, the pigment surface sometimes appears to be covered with a bronze sheen. Very often the true colour, or body colour, of the pigment is seen only when you look straight at the surface of the coloured article. This bronze effect is not, of course, due to the use of bronze or metallic powders but is really an optical effect.

At times the bronze tone can look extremely attractive, particularly when seen on the lettering of posters, where there is a richness associated with that of a metallic surface. But when seen as patchy areas on the enamelling of a motor-car body the bronzy tone appears very ugly indeed.

Many pigments are capable of giving a bronze effect, especially where the pigment has been applied to give a heavily coated surface. Red pigments usually show a yellowish bronze, blue pigments a reddish purple or coppery bronze, while yellow pigments seldom show a bronze at all. Most dyestuffs workers are familiar with the brilliant greenish bronze of methyl violet crystals and with the reddish purple or coppery bronze of 'Monastral' Fast Blue B. When the coated surface is exceptionally heavy the bronze can often be seen to the total exclusion of the body colour no matter at what angle the viewer stands.

The body colour of the pigment is due to the fact that white light, which is of course made up of a mixture of light of various colours in quite definite proportions (the colours of the rainbow), strikes the pigment surface, penetrates a certain

distance, and is stripped by its passage through the pigment of some of the constituent colours of the original white light. The colour of the resultant scattered ray, which is reflected back into the air, is therefore white light minus the colours removed by absorption in the pigment. A green pigment, for example, will remove red, orange, yellow, blue and violet light from the white light, leaving only the green rays, which are reflected back to the eye.

The presence of the bronze cast on the surface of pigments can be explained fairly simply, although the explanation deals only with "interface" bronze, or what we might call "surface reflection" bronze, which is the type one most usually meets. This "interface" bronze effect is due to the fact that certain of the colours which make up white light do not penetrate into the pigment at all but are reflected from its surface in the same way that light is reflected by a mirror; this is why the reflected ray can be more easily seen when the viewer is at an angle to the pigment surface.

In other words, the rays absorbed in the pigment are responsible for the body colour, while the reflected rays, which are of a different colour, give the bronze effect. This property varies from pigment to pigment, certain of them reflecting red, others blue, and some mixtures of colours. To take a concrete example, light which has penetrated into a coating of 'Monastral' Fast Blue B is stripped of all red, orange and yellow light as well as most of the green, and the body colour therefore appears blue; but the light reflected from its surface consists only of red and a smaller amount of blue light, and the "bronze" therefore has a reddish-purple cast.



A still from the film Penicillin, showing the original plate on which the mould penicillium notatum grew and stopped the growth of the bacteria on the dish. This stoppage of bacterial growth is shown by the clear area round the white patch, which is the mould.

HONOURS FOR I.C.I. FILMS

By B. W. Galvin Wright (Central Publicity Department)

THREE I.C.I. films were chosen this year to form part of the entry of British documentaries to the international festival of cinematographic art at Venice, and one of these, *The Life Cycle of the Malaria Parasite*, was awarded a first prize. The Venice festival is the most important of the international film festivals, and in the film industry it is regarded as an honour to have a production selected for it.

In 1950 two I.C.I. films were selected and two in 1949. So far, in addition to four diplomas of participation we have collected a first and two seconds. Last year twenty-two countries submitted entries, and, as the secretary of the association of specialised film producers said in his report, "the competition was fierce."

These facts are mentioned to show that I.C.I. has won a position of real significance in the documentary film world.

In a period of about eight years the Company has made ninety-five films—an average of eleven a year. What happens to these films when they have been made? Most people are familiar with the I.C.I. travelling film show, which takes some of the films around the Divisions to show to employees and their families. A total of some 40,000 people attend the travelling film show programmes—not as many of our 100,000 employees as we would like, but things may improve. What many people will not know is that during the autumn and winter months over a thousand audiences outside I.C.I. see our films each month; even during the summer months, when one might suppose that interest would be negligible, we supply over 400 copies a month to audiences.

Some of these audiences comprise five hundred people or more, others about twenty. But we can be certain that every year I.C.I. films are seen by many thousands of people in this country alone. Overseas we have not yet achieved a satisfactory method of measuring distribution, but every

month fifty or sixty copies of films are sent abroad for the use of I.C.I. overseas companies and agents. They all report the great value of these films in making special contacts with Government authorities, universities, hospitals and customers. I.C.I. films are now available for showing in every country in the world outside Russia and her satellites, although they are still being shown in parts of China.

What sort of audiences see I.C.I. films? The universities and the public, secondary and technical schools are large and regular users. Medical students, post-graduate students, doctors and nurses are obviously the audiences for our medical films. Veterinary students and practitioners, agricultural colleges and young farmers' clubs provide many audiences. Then there are the film societies, technical and scientific associations, the educational branches of the three services and adult education groups: even H.M. prisons provide audiences. Other industrial organisations borrow our films to show to their employees, while some of the films are shown to customers as an extension of the Company's provision of information and technical service.

Quite often I.C.I. films become features of the programme on important occasions. The new I.C.I. film *The Life Cycle of the Malaria Parasite* was shown this year at the British Association meeting in Edinburgh. To give other examples, I.C.I. films were shown after the recent annual dinner of the Royal College of Surgeons; at the festival year lecture of the London School of Tropical Medicine; and in the festival exhibition at the science museum in South Kensington.

Such I.C.I. films as *Colour*, *The Harvest Shall Come*, *Penicillin* and the *Technique of Anaesthesia* series are regarded as classics, and these with other I.C.I. films have been preserved for posterity in the national collection (maintained under Government auspices) of the British Film Institute.

WHERE MOUNTAINS STAND SENTINEL

By D. P. Milburn

I.C.I. (India)

(With photographs by the author)



Sikkim—land of high mountains and deep valleys

SIKHIM is a small state squeezed in between India and Tibet, Nepal and Bhutan. The word "squeezed," although geologically wrong, is descriptively correct, because Sikkim is a land of high mountains and deep valleys: so high that it holds the mighty icy Kanchenjunga, a god to the Buddhists; so deep that it is subtropical; so steep that the terraced cultivation of hillsides can rarely be practised, that road-building is impossible, that the monsoon deluge annually washes away mountainsides and with them the slender dangerous tracks, and that the traveller can rarely find a level patch to pitch his tent. Vegetation is lush in the valleys; the undergrowth is dense. One plant grows on another. Every tree seems a tangle of creepers and plays host to ferns

and mosses, fungus and orchids. It is a treasure-house of orchids, wisely protected by the state, and there are elusive perfumes which the inexpert cannot trace. Rhododendrons abound higher up: some small shrubs, others large trees—a blaze of glory in the spring. Here is the datura, with its long lily-white and lily-like flower; very beautiful—and very poisonous. Butterflies rival the wild flowers. Snakes and leeches are plentiful. Wild animals are few.

This is magnificent country but no place for luxurious sightseeing. You may take a pony, but there are places where he will prefer to be without you and you will prefer to trust your own legs. Torrents must be crossed, and where there is a bridge you must be thankful, even if it seems to be made of



There are few pastures . . .

bamboo poles and string. Famous men have travelled in Sikkim. There was Sir Joseph Hooker, who, with Dr. Arthur Campbell, was seized and imprisoned here a hundred years ago, an incident which led to territorial changes. Hooker is famed for his *Himalayan Journals*, in which he describes a Sikkim far less accessible than it is today; then there are the famous mountaineers of recent times, who take what is to

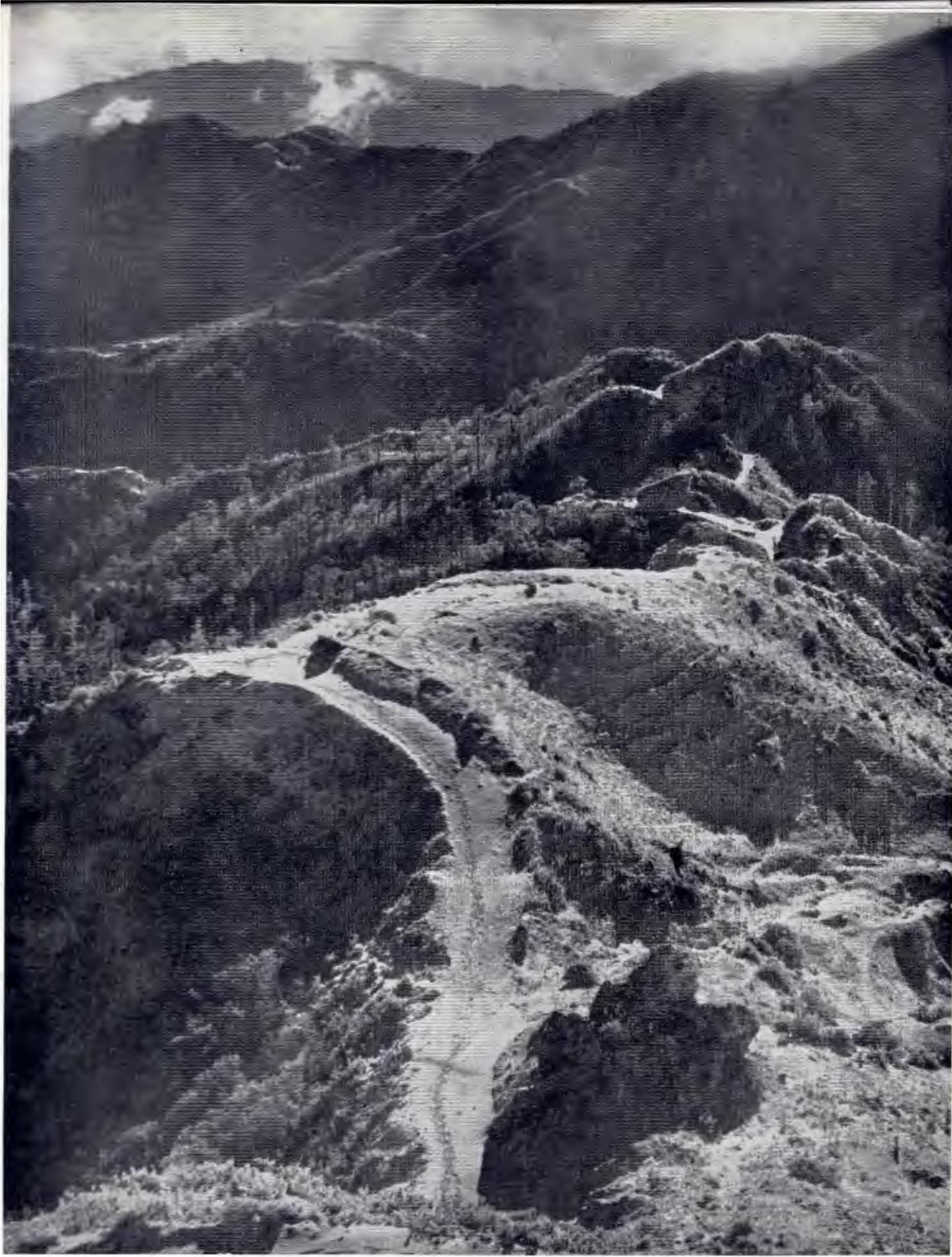
them an easy walk up Sikkim to attack the mountain giants from unexpected quarters. The country has been well described by F. S. Smythe in *The Kangchenjunga Adventure*, by Marco Pallis in *Peaks and Lamas*, and in the *Journal of the Himalayan Club*. A delightful little book, published in Calcutta, is Percy Brown's *Tours in Sikkim*, recently revised by Joan Townend.



You may take a pony . . .



Happy with his load . . . happy without it



Only one road leads to Sikkim



The high hills of Sikkim

Only one road leads into Sikkim. It comes from Kalimpong in India and goes north to Gangtok, the capital, where it stops. Elsewhere access is by mule tracks over passes which in the north and east are over 15,000 ft. high. The mountains stand sentinel, and defence is both easy and difficult.

Sikkim is a frightening land. As you travel north from Gangtok the mountains tower above, and when they gather the storm clouds you feel you are in their power. The river Teesta roars far below, muddy and turbulent. When the land slips, it is down to the river that it goes. With it perhaps goes your track and a new one must be cut. A huge landslip can dam the river, hushing it to a lake of sinister silence, so deep that the tree-tops now pierce its surface. Such a mass of water, pent up in a steep and narrow valley, threatens destruction to all below, and it is the difficult task of engineers to release it gradually. Twice within recent years such a disaster has happened and Lachung and Chungthang have been swept away. Chungthang had an earlier frightening experience when a whole mountainside came tumbling down. A huge cloud of dust rose up and descended, smothering countless birds in their flight.

It is not surprising that the people of Sikkim are few in number. There is little scope for the rearing of cattle; the leeches weaken them, and there are few pastures. The traveller

must carry food for himself and his ponies, for the people have little to sell. Life is hard, but the people are not so. The nature-loving Lepchas, the venerable Tibetans and the industrious invading Nepalis are all different and all delightful. They know how to smile and are honest. The coolie seems happy with his load.

The influence of Tibet is considerable. The state religion is lamaistic Buddhism. The ruling family is of Tibetan origin, and the male descendants take their brides from Tibet. Llasa is to these people what London is to the exiled Englishman, even if they never see it—the centre of their civilisation. New fashions, very discreet by our standards, are set by the ladies of Llasa and copied by those of Gangtok.

Sikkim has lovely monasteries, of which that at Pamionchi is best known. They stand in lofty places, surrounded by their many prayer flags—narrow white strips with their length in the vertical, inscribed with prayers which flutter to heaven in the breeze. One turn of their prayer-wheels, similarly inscribed, will have the same result. Although countless prayers can thus be offered with little effort, there is here a belief in the power of prayer and a god to pray to. It would be easy to underrate the depth of religious thought among these people. Buddhism has appealed to many western intellects, and the reader is referred again to *Peaks and Lamas* by Marco Pallis.

J. M. Smith

(Paints Division)

JAMES SMITH is a Grade I varnish-maker at Paints Division, Slough. Controlling a number of different raw materials at high temperature is a job requiring considerable skill and self-confidence.

He makes varnish in 120-gallon "kettles" over fuel-oil furnaces, at a temperature of 575-600° F., by one of the oldest methods known, but nevertheless the most effective. In this work knowledge and judgment are the determining factors. If these were faulty, serious accidents might take place. The fumes from his furnace kettles can be as inflammable as solvent vapour. If he were careless and allowed the furnace temperature to rise too high, the mixture would boil over and catch fire. If he were too cautious, the furnace would never reach the temperature at which the required reaction takes place.

But varnish-making is only one of Jim Smith's accomplishments. First and foremost he is an ex-soldier with a long and varied fighting experience. Born in Paisley forty years ago he joined the Army in 1928, going on the Reserve in 1931. During these three years he distinguished himself as an army athlete. He was a member of his regimental team which won the army sports championship in 1928, 1929 and 1930, and he represented the regiment in three-mile and six-mile events.

Called up as a reservist in August 1939, Jim Smith was in France with his old regiment a month later. He will tell you lightly that he found it easier to get into France than to get out. He was left behind in France in June 1940. After six weeks of hairbreadth escapes from the Germans he reached Southampton from St. Malo in a commandeered French fishing smack.

He was granted forty-eight hours' leave when he located his unit, but a fortnight later he was at sea again, on a three months' voyage to Egypt round the Cape of Good Hope. He served in Crete from November 1940 until the evacuation and almost immediately afterwards took part in the fighting against the French in Syria, where he was wounded. His wounds kept him in hospital for three months. Soon after he rejoined his unit it was besieged for several months in Tobruk. His division was then ordered to Rangoon but did not land there, as Rangoon fell while they were at sea, and the convoy was diverted to India. There followed a long spell in India training with General Wingate's Chindits, then an expedition into Japanese-held Burma with the famous 84 Column.

Jim Smith returned from Burma suffering from malaria and malnutrition and was sent home to England to recover. When fit again (and now a sergeant) he trained as a paratrooper. A fortunately timed spell of malaria kept him in hospital when his unit took part in the Rhine crossing and the glider he should have been in was shot down in flames.

A keen Works Councillor, Jim Smith was a member of the Division Council and since 1949 has also been Paints Division representative on the Committee of Management of I.C. (Workers') Friendly Society. In his spare time he is a special policeman. He lives at Slough with his wife and two daughters.





"Hagen knew that he drew the crowds, and had a rare sense of his own worth"

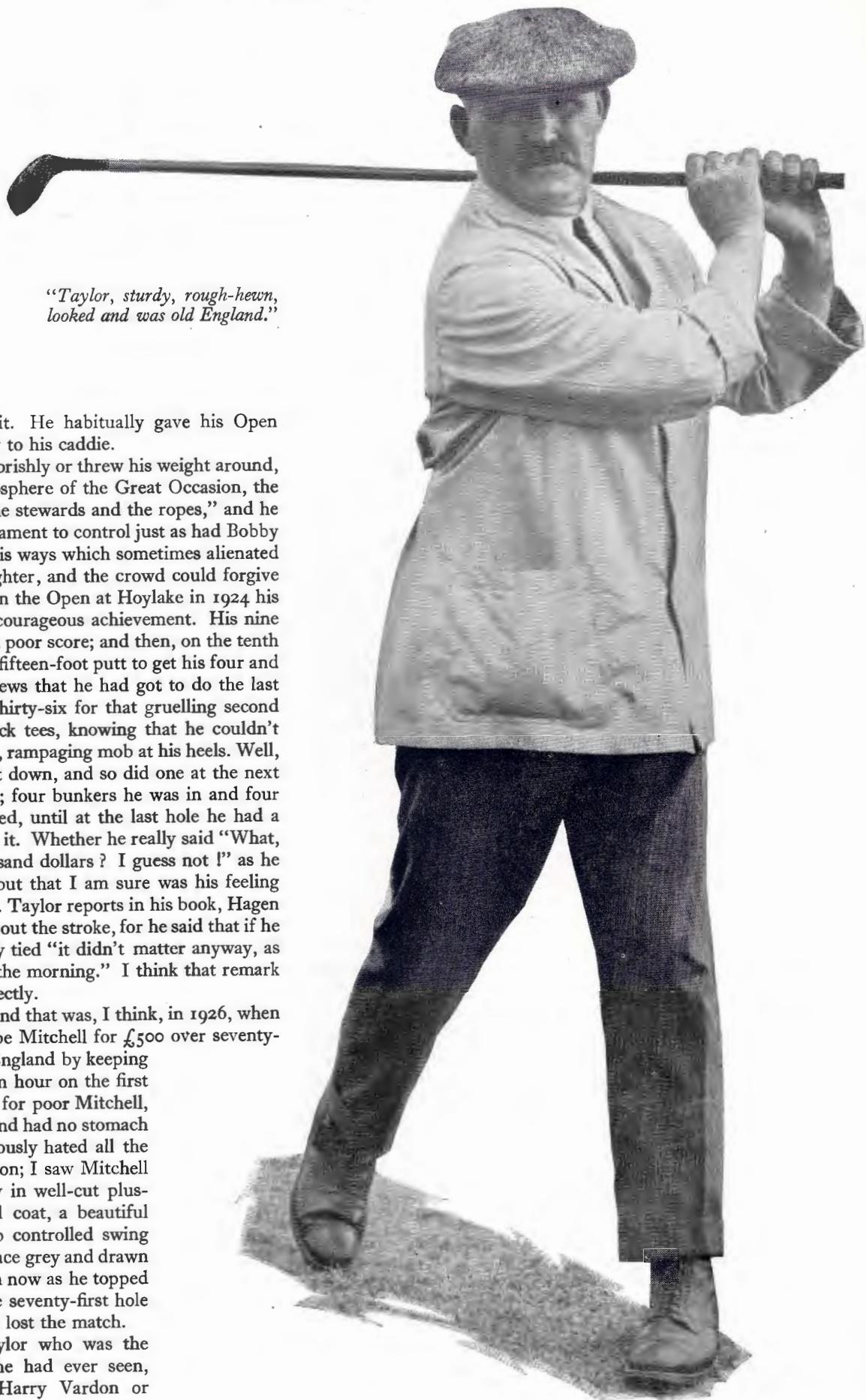
Who's going to be second?

By Peter Allen (Director, Paints and Plastics Group)

AT first sight you would not think that J. H. Taylor and Walter Hagen had much in common, but they had. Taylor, sturdy, rough-hewn, jaw stuck out, ruddy-faced, cap well down, trousers well turned up, hard collar, boots flat-footed on the turf, short clipped swing, looked and was Old England. Hagen, swarthy, debonair, dressed in the height of fashion, brown and white shoes, smooth and shrewd, looked and was a successful American business man. But both were magnificent golfers in their prime, Taylor winning the British Open Championship five times and Hagen four, and if the qualifying rounds had been added in it would have been Taylor who would have won again in 1924, at the ripe age of fifty-three, and not Hagen. Not only were they both very fine players, but both had the aggressive self-confidence—that killer spirit, if you prefer an uglier phrase—which a champion at any sport must have, and both were at their best when things were toughest.

Both, too, did much for their profession. As Bernard Darwin has so often written, Taylor found the trade of professional golfer sixty years ago only one stage removed from that of caddie, and by his example and his character, as leader and as spokesman, raised it to be a highly respectable profession where a good regular living could be made. Taylor indeed made more of it than that, adding a profitable club-making business. Hagen thirty years later went one stage further and opened to the golf pro the possibility of his trade becoming Big Business.

Hagen was a great showman who knew that he drew the crowds and had a rare sense of his own worth. No diffident changing of his shoes in the pro's shop and quiet, unobtrusive approach to the tee. He would arrive in an enormous motor-car and stalk in the clubhouse smoking a cigar. If he was late it was too bad. The tournament and all the rest of them had to wait—and he was never disqualified; the crowd had come



*"Taylor, sturdy, rough-hewn,
looked and was old England."*

to see him and he knew it. He habitually gave his Open Championship prize money to his caddie.

Taylor never behaved boorishly or threw his weight around, but he too loved "the atmosphere of the Great Occasion, the trampling of the crowds, the stewards and the ropes," and he certainly had a fiery temperament to control just as had Bobby Jones. Hagen, in spite of his ways which sometimes alienated people, was a wonderful fighter, and the crowd could forgive almost anything for that. In the Open at Hoylake in 1924 his last round was a splendid courageous achievement. His nine holes out in forty-one was a poor score; and then, on the tenth green as he was lining up a fifteen-foot putt to get his four and save the hole, he got the news that he had got to do the last nine in thirty-six to win, thirty-six for that gruelling second half at Hoylake off the back tees, knowing that he couldn't drop a shot, with a running, rampaging mob at his heels. Well, that putt on the tenth went down, and so did one at the next and one at the twelfth also; four bunkers he was in and four recovery shots out he played, until at the last hole he had a nine- or ten-foot putt to do it. Whether he really said "What, miss that putt for ten thousand dollars? I guess not!" as he lined it up I don't know, but that I am sure was his feeling about it. Certainly, as J. H. Taylor reports in his book, Hagen had felt no apprehension about the stroke, for he said that if he had missed it and had only tied "it didn't matter anyway, as I'd have beaten the boy in the morning." I think that remark sums up "The Haig" perfectly.

I saw Hagen only once, and that was, I think, in 1926, when he was matched against Abe Mitchell for £500 over seventy-two holes and angered all England by keeping Mitchell waiting for half an hour on the first tee. This was clearly agony for poor Mitchell, who was a nervous player and had no stomach for a rough fight and obviously hated all the hurly-burly of a big occasion; I saw Mitchell many times, neat and tidy in well-cut plus-fours and usually a tweed coat, a beautiful shot-maker with that crisp controlled swing of his, but so often with a face grey and drawn with anxiety. I can see him now as he topped that fatal spoon shot at the seventy-first hole at St. George's Hill and so lost the match.

I once asked J. H. Taylor who was the best striker of the ball he had ever seen, expecting him to name Harry Vardon or

Bobby Jones, but without a moment's hesitation he said "Abe Mitchell," but added "I didn't say he was the best golfer, mind, but the best striker of the ball." At one time I saw something of J.H. because his son was up at Oxford with me, and, like all the undergraduates, I delighted in J.H.'s salty vehement talk. While on the subject of Mitchell I must recall another of J.H.'s conversations; it was about the 1933 Ryder Cup match, in which Taylor was non-playing captain. He said "I had a terrible lot of trouble with that fellow Abraham Mitchell, Abe Mitchell they call him, Abraham Mitchell. He came to me on the night of the foursomes and said 'It's no good, John, it's my back; I can't play.' I said to him 'Abraham, you're going to play tomorrow. You can have your choice—you can have Hagen, you can have Sarazan or you can even have Dutra—but you're going to play tomorrow.' So he said 'All right, John, but it's no good, it's my back.' So I asked him which one he'd take, and he said 'It's no good, John, but I guess I'll take the big b—.' And he murdered him, sir, he murdered him, sir, he murdered him!"

J.H. liked the Johnsonian "sir" and liked to say things thrice. I saw once in his shop at Mid-Surrey a picture of W. G. Grace on the course, bearded, booted and armed with a club that looked like a walking-stick. I asked J.H. how the Doctor played golf, and he replied "Like a boy, sir, like a boy, sir, like a boy."

While J.H. Junior was up at Univ. his father always brought down a team of professionals to play against the undergraduates, usually taking the bottom place in the side himself and partnering Sandy Herd in the bottom foursome, but his support for his team from the rear was vigorous and vocal in the extreme for all that. J.H. always enjoyed these occasions and at the dinner after the match could always be relied on for a good speech, for he was an excellent after-dinner speaker, fluent, forthright, and saying truthfully what he meant. His speech at the dinner after the University golf match at Princes in 1928 will always be remembered by all who heard it, for he said much from the heart and yet without embarrassing his son or anybody else who was there or introducing a single false note into a festive occasion. Those days of association with Oxford gave him great pleasure, and he says in his book that his son's election as President of the Junior Common Room at Univ. gave him more pleasure than any of his five wins in the Championship.

I have always enjoyed the sayings of golfers, like the no doubt apocryphal one attributed to Hagen which is the title of this essay. Certainly J.H. made two remarks which have gone down to history, the first a masterly defence of pitching, "There are no bunkers in the air," and the second which for ever demolished the idea of fancy play from the tee, "What's the matter with the middle of the course?" One of my favourites is a monosyllable vouchsafed by Harry Vardon. When Bobby Jones was a very young man he had a job keeping his feelings under restraint and liked to chatter during the game. Early in the round he topped a shot which flew over the green into trouble, and turning volubly to Vardon he said "Did you ever see a worse shot than that, Harry?" "No," said Vardon, and played the rest of the round in silence. Vardon is also reputed to have said to a lady member "Moderation is essential in all things, madam, and never during the whole of my golfing career have I been beaten by a teetotaller." But best of all I enjoy Ted Ray's classic advice to an impertunate member who kept pestering him to know how to drive further; taking his pipe momentarily from his mouth, Ray replied "Hit it a bloody sight harder, mate."



"Poor Mitchell obviously hated all the hurly-burly of a big occasion"



*Ted Ray and his pipe:
"Hit it a bloody sight harder, mate"*

I.C.I. NEWS

Mr. J. L. S. Steel

Mr. J. L. S. Steel, until recently I.C.I. Overseas Director and now Director of Group A, Heavy Chemicals, has been elected chairman of the British National Committee of the International Chamber of Commerce.



The International Chamber of Commerce has its headquarters in Paris and is composed of representatives of thirty-one countries. Its members are both producers and consumers, and its policy reflects the opinion of all branches of business, commerce, industry, finance, transport and insurance. Its ultimate goal is to produce conditions for a freer and smoother flow of the international exchange of goods. The International Chamber of Commerce is an unofficial body, but it has the distinction of being one of the few unofficial organisations granted the highest consultative status with the Economic and Social Council of the United Nations.

In general, the work of the I.C.C. falls under two broad headings:

- (a) Broad studies of economic policy.
- (b) Technical studies of more limited scope.

Both types of work are based upon discussions in the thirty-one national committees, and it is the duty of the national committees to make the views of the International Chamber known to their own governments, as well as to their own business committees, and to seek to get the I.C.C.'s recommendations adopted.

Even if these recommendations are not by any means always implemented, and even if, as has often been the case, much patient and painstaking labour in committee has been without concrete result, the very fact of bringing the experts of many nations together to explore and to seek to resolve common problems has had the effect of greatly extending the understanding between the business men of different countries of each other's viewpoints and difficulties, and this extended comprehension and even sympathy has been in time reflected in the attitude of governments when they come to approach these problems between themselves.

As far as the British National Committee has been concerned, apart from its principal duty of representing British commercial interests on the I.C.C. itself, there has been an increasing tendency on the part of British Government depart-

ments to confer with it upon international matters which fall within its province.

In these days of always-increasing international organisation, and with all the economic and financial implications of such conceptions as the Schuman Plan, the North Atlantic Treaty Organisation and the international boards formed for the procurement and allocation of raw materials, the need for consultation between governments and those who have a direct and practical experience in the day-to-day handling of problems of world trade requires no stressing. In the important influence which the International Chamber of Commerce must continue to exercise in the field of international commerce the British National Committee has a direct and heavy responsibility to ensure that British interests and experience play their just part.

Duke of Edinburgh presents Endeavour Prizes

Sir Wallace Akers, I.C.I. Research Director, represented the Company at the recent meeting of the British Association for the Advancement of Science in Edinburgh. On the afternoon of 9th August the Duke of Edinburgh in his capacity as president of the Association presented cheques to the prize-winners in the competition for essays on selected scientific subjects organised by *Endeavour*. In conversation afterwards with Sir Wallace His Royal Highness expressed a wish that he might receive copies of *Endeavour* regularly.

The *Endeavour* annual competition—for which there is an age-limit of 25 years—is organised with the double object of stimulating the interest of young scientists in the work of the British Association and encouraging the writing of good



Sir Wallace has tea with the Duke after the presentation

English. This year seventy-six essays were submitted, almost all of a very high standard. The first prize, of fifty guineas, was awarded to 23-year-old B. C. Kilkenny, of Oxford University, for an essay entitled "Biological Effects of Radiation." The other prizewinners were J. H. Pantin, also of Oxford University; P. G. Garner, of King's College, London; and M. J. Sheridan, of Hornsey County School.

Among the speakers this year at the British Association meeting was Dr. J. Swallow of Plastics Division, who spoke on synthetic polymers to the Chemistry Section of the Association. A considerable number of members visited the Company's works at Grangemouth, which manufactures 350 different dyestuffs and drugs, including such important products as 'Caledon' Jade Green, 'Monastral' Fast Blue, and 'Paludrine.' A film show on the last day of the meeting included a twenty-minute film on the life-cycle of the malaria parasite, made by the I.C.I. Film Unit.

Aid for Jamaica

A free gift of much-needed drugs and other materials worth about £2400 has been despatched by I.C.I. to aid health services and rehabilitation work in Jamaica after the recent disastrous hurricane. A quantity of drugs was flown to the stricken island on 30th August, and five tons of bleaching powder for water chlorination and sanitation, and a ton of 'Gammexane' to combat the fly menace which has developed since the hurricane, were shipped in the s.s. *Barranca* on 4th September. A cable of thanks has been received by Mr. John Rogers, Chairman of I.C.I., from Sir Hugh Foot, Governor of Jamaica.

A number of reports have been received from our Jamaica office dealing with the hurricane, and some of these details may be of interest to readers of the *Magazine*.

At the time that the hurricane struck, the I.C.I. office in Kingston was in the charge of Mr. A. J. Lucas, who was acting for Commander W. de M. Clarke, then in the United Kingdom on leave. For those of us who have never experienced a hurricane it is hard to imagine what must have been passing through the minds of those who live on the island of Jamaica as they sat and waited for the onslaught. In our own office all papers were locked away and anything movable was secured. The staff were allowed to go to their own homes at 1 p.m. to give them ample time to do all the battening down that was possible and to await the hurricane, which was expected at 8 p.m. The value of such precautions can quite well be appreciated when we learn that all the I.C.I. staff houses and the office itself suffered only negligible damage, which was mainly caused through water.

The hurricane was the most severe in living memory, and it caused immense material damage to crops, industry and buildings, the cost of which is estimated to run into millions of pounds sterling. It flattened the eastern parish of St. Thomas and dealt harshly with Kingston itself. Communications all over the island were cut, and it took several days to clear the roads of fallen trees, power and telephone cables and landslides. Fortunately, the death toll for the whole island is low, considering the devastation.

In southern St. Thomas 80% of the population is homeless and destitute and hardly a building stands. Hospitals were destroyed, rendering aid to the injured and dying very difficult. Due to a complete breakdown of water mains, rubbish disposal and sewage, there was a very serious danger of epidemic. Relief supplies, drugs, tents, food, and materials for the repair of buildings were rushed to the devastated areas, where the morale

of the population remains amazingly high, although one wonders how long this state of affairs will continue when foodstuffs become scarce.

The rest of Jamaica suffered less severely, and on the north coast there was only slight damage. In Kingston itself road communications were quickly restored and port facilities returned to normal. There is, however, considerable damage to property, and in the town itself about 20% of roofs have gone with the wind. The population in the Kingston area is fully occupied in repair work and in foraging for materials to complete their repairs.

Under the personal direction of Sir Hugh Foot, the Governor, public services are being restored surprisingly quickly. Already water is supplied to a number of districts, and electricity has been restored to vital services, although not to the general public. It is expected that our own office will be without the telephone for three or four weeks.

Public order has been maintained very effectively, and predatory gangs of marauders, armed with machetes, demanding work but eager for loot, were quickly broken up by mobile armed police patrols. When a wall of the local gaol was blown down a number of the prisoners broke out, but many of them were perfectly happy to use the free time at their disposal to visit the women's section of the gaol.

The homes of most members of the staff held firm against the wind, although the rain penetrated everywhere through walls, roofs, windows, doors and jalousies. The house in which Mr. Lucas himself lives was damaged to such an extent that it will have to be pulled down and rebuilt, and one other house belonging to the parents of a member of the office staff was also completely destroyed, although fortunately without loss of life.

Mr. Lucas was proud to be able to inform us that, regardless of the hurricane and the chaos which resulted, the I.C.I. office in Kingston opened as usual on the Monday morning following the storm.

HEAD OFFICE

Mr. Max Woosnam on Government Committee

Mr. Max Woosnam, Personnel Manager for Head Office and the Regions, is a member of the committee appointed by the Minister of Labour and National Service to enquire into footballers' conditions of employment, including contracts. Chairman of the committee is Sir John Forster, K.C., and the other members are Mr. G. H. Savage, Mr. Herbert Sutcliffe, the former Yorkshire and England cricketer, and Mr. G. B. Thorneycroft.

Few people could be more fitted to serve on a committee to enquire into footballers' conditions of employment than Mr. Woosnam, who was one of the most distinguished athletes of his time and one of the most famous footballers this country has ever produced. At Cambridge, in the years before and immediately after the first world war, Max Woosnam had the unique distinction of gaining a quadruple blue, having represented his university at soccer, golf, lawn tennis and real tennis. He was also twelfth man in the Cambridge cricket team at Lord's in 1912.



Before the first world war he played for the Corinthians and was on tour with that team in Brazil when war broke out. The team returned to England without playing a match and Max Woosnam joined his county Yeomanry regiment, the Montgomeryshire Yeomanry, then later went overseas with the Royal Welch Fusiliers.

It was in the years following the war that Max Woosnam made his real reputation as an athlete. He was described as being "blessed with wonderful stamina, an 'eye,' and that intangible games asset called judgment." During the spring of 1919 he played as an amateur for Chelsea. Later in the year he joined the firm of Crossley Brothers, Manchester, and during the 1919-20 season he played for Manchester City, captaining the team during the latter part. For the two following seasons he was captain of Manchester City. In 1922 he played for England three times, twice in amateur games, and he also captained the professional side against Wales. He broke his leg in one of the last games of this season, and as he joined Brunner, Mond & Co. the following year he severed his connection with Manchester City, although he played for them in odd matches afterwards.

In the tennis world Max Woosnam was equally famous. He represented England at the Olympic Games in 1920 and 1924, won the men's doubles and the all comers mixed doubles at Wimbledon in 1921, and also captained the Davis Cup team in America in that year.

I.C.I. Girl wins Beauty Competition

Miss Barbara Jones, of Imperial Chemicals Insurance staff, when on a week's holiday recently at Morecambe, was selected as the winner of the beauty competition for that week.



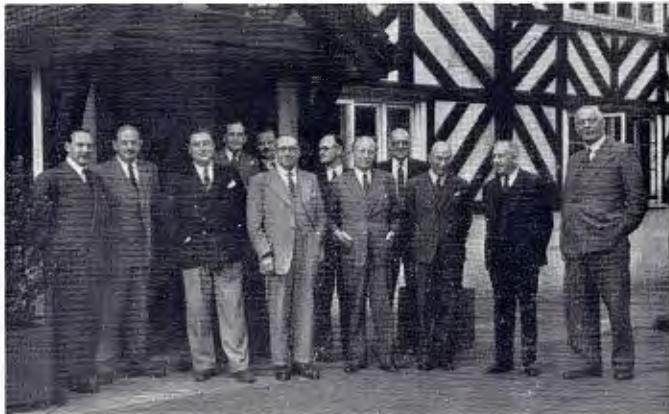
She has qualified, therefore, to appear in the final with a number of other young ladies, and the best wishes of her friends go with her in the hope that she will win the first prize. We hear that competition was very severe, and hearty congratulations are due to her on winning in a most distinguished company.

ALKALI DIVISION

Chairman's Visit to Winnington

The Alkali Division was honoured on 30th August to receive a visit from Mr. John Rogers, O.B.E., Chairman of the Company. During the course of the day he made a tour of some of the alkali extensions, including the new lime beds and the new railway line linking Winnington and Wallerscote Works with the main L.M.R. system at Hartford Junction. He also saw something of the housing developments being carried out by the Northwich Rural District Council for the accommodation of the increased labour force necessary to construct and operate the extended works.

In the evening he had dinner at Winnington Hall with members of the Division board and senior officials of the Division. Speaking after dinner, Mr. Rogers recalled an occasion when he had visited Winnington some years before the formation of I.C.I. when he had been with Nobels. He mentioned that it



Visitors from Crosfields meet Mr. John Rogers. Left to right: Messrs. W. M. Jackson (Supply Manager, Crosfields), D. G. Emerson (Export Sales Manager), A. S. Irvine (Information Service Manager), E. Langford (Export Sales Director), G. A. Richmond (Home Sales Manager), D. Drummond (Director and Chief Accountant), A. C. H. Cairns (Sales Manager, Crosfields), J. K. Batty (Joint Managing Director), J. W. Gibb (Commercial Director), J. A. Fox (Managing Director, Crosfields), Mr. Rogers and Mr. Inman.

was many years since he had last visited Winnington but he hoped it would not be long before he came again, and he expressed a special wish to see the Research Department and the Caustic Plant.

E.C.A. Scholarship

Twenty-seven-year-old Mr. Malcom Bowyer has been awarded a scholarship by the Economic Co-operation Administration, and with it he hopes to go to the U.S.A. for a year to learn more about foundation design and soil mechanics. Of his twelve months in America he would like to spend six at Harvard University studying these subjects under experts, while during the remainder of his stay he would gain practical experience in American industry.

Mr. Bowyer, who is a graduate of Manchester University, served in the Fleet Air Arm for 2½ years before joining I.C.I. in February 1947. His present position is civil maintenance area manager of the Winnington Works Maintenance Department.



BILLINGHAM DIVISION

Synthonia Club Trophies

The impressive photograph overleaf shows the Synthonia Club trophies, taken recently when they were being valued for insurance purposes.

There are 61 shown in the picture and another 13 of them which were not on view at the time, bringing the total number of cups and trophies at present held by the Synthonia Club to



Synthonia Club trophies

74. Of this total, thirty have been won in open competition in north-east sporting events and the remainder are owned by the club itself for inter-works, inter-section and inter-departmental competitions.

DYESTUFFS DIVISION

Blackley Scouts at World Jamboree

Blackley Works had two representatives at the Boy Scouts' World Jamboree at Bad Ischl in Austria this year. They were Mr. H. T. Hagreen, leader of the Manchester contingent, who is employed in Work Study Department, and Mr. Neville Magee, an apprentice joiner. They thoroughly enjoyed their trip abroad and have given us the following account of their experiences:

"Each jamboree has a title around which the spirit of that particular jamboree is built. Moisson (France, 1947) was called the Jamboree of Peace, as it was the first to be held



(Daily Graphic Picture)
Four Manchester Scouts hoist their flag at the Jamboree. Neville Magee is second from the right.

after the war. This year's title was the Jamboree of Simplicity, which indeed it was. There were few big public displays and parades, and the emphasis was kept all the time upon the individual. This was one of the reasons for limiting the total number of Scouts to 15,000. Moisson was twice as big. The French railways and the Cie. Internationale Wagon-Lits, who carried us and fed us from Dieppe to Bad Ischl, seemed to take the word simplicity far too much at its face value, however,

and 36 hours of French third-class carriages and stale rolls was quite sufficient at one stretch. We were unfortunate on both the outward and return journeys in that we passed through Switzerland during the night and missed some of the most interesting scenery.

"Reports in newspapers and on the radio apparently gave the impression that the weather was very bad, but this was not the case at all. We did have three very severe thunderstorms, all at about 6 p.m., and after two of them the rain fell steadily until the midday following, but other than this the weather was glorious and almost everybody lost at least one layer of skin. Our time at the jamboree was well spent in getting to know Scouts of other nationalities, bridge-building (to British Scouts one of the best points about the jamboree was the amount of timber available for them to use as they wished), swimming in the lovely lakes and rivers, and in sightseeing at such places as Salzburg. The only trouble was that nobody had enough money to spend. One disappointment due to the unsettled weather was the cancellation of a journey up the Dachstein glacier—the largest in Europe. It was fortunate, however, that we did cancel it, because one of the storms, which occurred on the night we had intended to spend at the hostel at the foot of the glacier, would have put paid to our intentions anyway.

"Summing up, it was a good jamboree; in fact, somebody who has been to four said that it was the best, and everybody who went is hoping against hope that they will also be chosen to go to the next."

I.C.I. Bowling Green Honoured

The thirty-sixth individual merit competition of the British Crown Green Amateur Bowling Association, which is the national championship for crown green bowlers, was held at Huddersfield on 6th August. The games were played on the greens of the Huddersfield Works Recreation Club in Leeds Road. These greens were this year judged to be the best in the county, in the Yorkshire Greenkeepers' Competition, with 98½ points out of a possible 100. Although the attendance was greatly affected by the pouring rain, the bowling was of the expected high standard throughout the day. The contestants were the last eights from the various county merit competitions held this year. The winner was J. Pilling and the runner-up W. Worthington, both of Lancashire.



Mr. Harold Hammond keeps his greens in trim

Much of the credit for the national championship being held at the Recreation Club must go to Mr. Harold Hammond, the groundsman at the club, and his three assistants, Mr. Herbert Sanderson, who is also regarded as a local authority on roses, Mr. Jack Hand and Mr. Lewis Shaw. Mr. Hammond started at Huddersfield Works in the Yard Gang in 1926 and about two years later went to work on a nearby farm owned by British Dyestuffs Corporation Ltd. The farm buildings still exist, but the manufacturing plants now cover most of its fields. Born at Moor Top Farm, Kirkheaton, Mr. Hammond remarks that he was brought up in growing grass.

About the time the Recreation Club was formed at Leeds Road in 1931, Mr. Hammond went there as groundsman and helped in the work of making the putting greens and the two bowling greens. One of the bowling greens is laid with Cumberland turf, and the turf for the other came from a Manchester golf course.

In 1936 Mr. Hammond became head groundsman, and under his management, in addition to this year's win, the greens have had two firsts and two thirds to their credit in the Yorkshire Greenkeepers' Competition organised by the *Yorkshire Post*.

LIME DIVISION

Well-known Peakland Bandsman Retires

Mr. Jack Fletcher, who has recently retired after nearly 47 years' service with I.C.I. is well known in the Peak District

as a musician. He first became interested in music when he joined a church band at Great Rocks in 1903. Now, at the age of 65, Mr. Fletcher is conducting Dove Holes Public Band, which he reckons is the eighteenth band he has conducted. He has at one time or another conducted most of the bands in the district.

During his career as a musician he has won forty medals and several cups. He was solo cornet player to the famous Creswell Colliery Band in 1922

when the band gained two first prizes at a Dinnington contest. The same year he gained eighteen medals and prizes, mostly for solo cornet playing.

In 1923, at the Great Britain and Colonies championships at the Crystal Palace, Creswell (with Mr. Fletcher still solo cornet) gained fourth prize. A third at the 1937 Belle Vue contest and two cups in the following year were won by Darley Dale Band with Mr. Fletcher conducting.

At Belle Vue in 1947, conducting Thornsett Band, Mr. Fletcher gained for them second prize, with twenty-two bands competing. Two first prizes, three cups and three specials resulted when Mr. Fletcher conducted Fairfield Band at the 1948 Tideswell contest. At the age of 60, at Matlock in 1946, Mr. Fletcher won the first solo contest prize.

With his aid Dove Holes hope to regain their position as one of the leading bands in the High Peak. Their first sign of success was a second prize won at a Haddon Hall contest in June.

Mr. Fletcher's 20-year-old son, John, is a member of Dove Holes band and is a promising trombone player.



METALS DIVISION

Mr. J. E. Malam Retires

Mr. J. E. Malam, who has been a member of the Metals Division board since 1939, retired at the end of August after 37 years' service with I.C.I. and its predecessors.

His Company service began with six years at King's Norton, and he was transferred to Kynoch Works as chief assistant in the Technical Laboratory in 1921. Eight years later Mr. Malam, as technical assistant to the works manager, became responsible for production control, and in 1932 he was given charge of development work for the Metal Group. In 1939 he was appointed Production Director, Wrought Metals.



Mr. Malam's wide vision and great practical experience have made a big contribution to the Division's progress, as under his direction several major development schemes have been carried out.

Mr. and Mrs. Arthur Smith

It is with great pleasure that we record an important event in the life of a Metals Division pensioner, Mr. Arthur Smith. This proud and happy gentleman and his wife celebrated their diamond wedding anniversary on 3rd September and emerged from the quiet retirement of life in a Staffordshire village for the excitement of family parties, press interviews and hosts of congratulations and good wishes.

Mr. Smith, who was a patternmaker, joined Kynoch Works in 1893 and was a member of the Pattern Shop personnel for just under forty years, retiring at Christmas 1932. Today, at 84 years of age, he looks perfectly capable of taking up employment again. Tall, upright and extremely vigorous, he calls upon an excellent memory to recall the far-off days when (before joining Kynoch's) he walked four miles to and from his work in addition to putting in a thirteen-hour day at the bench. All the great events in forty years of the factory's history, and all the well-known personalities who helped to bring them about, are as familiar to Mr. Smith now as the vegetable garden he still cultivates.

Mr. and Mrs. Smith live with their daughter, who gave up her post as headmistress of the local school to look after her mother during an illness a year or two ago. Their family is not large but, in Mr. Smith's words, "very devoted," and a toddler great-grandchild helps to keep everyone young in spirit.

Asked if he had any message to pass on to young people just starting out on their careers, Mr. Smith answered without hesitation. "Yes," he said; "tell them to take as much pleasure in their work as they do in their pastimes. Make a hobby of it and don't watch the clock!" From one who, throughout all his years as a skilled craftsman, never lost even a week through illness, that advice may be regarded as likely to reap handsome dividends!

NOBEL DIVISION

Division Board Appointments

Considerable changes have been taking place in the composition of the Nobel Division board recently. Some of the appointments have been effective for some months and some took effect on 1st October.

At the end of September Dr. J. W. McDavid, C.B.E., chairman of the Nobel Division board, retired, so bringing to an end a long and distinguished career which began in the Ardeer factory of Nobel's Explosives Company Ltd., in September 1912.

He was succeeded as Division chairman by Dr. W. J. Jenkins, who was appointed deputy chairman in March of this year and whose experience of Division work and management is long, varied and extensive.

Dr. McDavid held his responsible post during the critical years of transition from war production to a peacetime production, in which the Division met the heavy demands of home markets and simultaneously sustained a large export trade. It was an adventurous and difficult period in the Division history. There was great development and redeployment of Division resources, and the level of production together with the numbers employed were much greater than was thought likely when war ended.

The late Division chairman brought to his task many qualities, among which none was greater than his gift of "getting along with people." He had an instinct for friendliness and candour with all grades in the Division which established confidence. This quality was always evident at Division Council meetings.

Dr. McDavid attended Edinburgh University from 1904 to 1910, graduating B.Sc. in 1908, and he became an M.Sc. of Manchester University in 1912. He was a Carnegie Research Scholar at Edinburgh from 1908 to 1910, and from 1910 to 1912 he was "1851" Exhibition Scholar. He was awarded a D.Sc. by Edinburgh University in 1916.

After joining the Company Dr. McDavid worked in research until September 1914, when, as a lieutenant in the R.F.A. (reserve), he went to France in the B.E.F., and he holds the 1914 Star. He was recalled from the forces and in April 1915 was appointed superintendent of the Guncotton Department at H.M. Factory, Pembrey, South Wales.

In 1919 Dr. McDavid returned to Ardeer, and in the next ten years he filled production posts of increasing responsibility until in 1929 he was appointed works manager of Ardeer Factory. From 1933 onwards he was Production Manager, then a Production Director of the Explosives Group (now Nobel Division) of I.C.I. In May 1941 Dr. McDavid was seconded to the Ministry of Supply to be Deputy Director-General, Ordnance Factories (Explosives). He remained with the Ministry until May 1942, when he returned to the Company as Joint Managing Director of the Division. In recognition of his services during the second world war he was made a C.B.E.

When the late Mr. Adam Wilson retired in 1945 Dr.



McDavid became chairman of Nobel Division. He was also a director on the delegate board of General Chemicals Division and a member of the Wilton Council. As Scottish Regional chairman of the F.B.I. in 1950 he did much valuable work.

Dr. McDavid has many private interests which include a liking for gardening, golf and football, a game he once played with success as goalkeeper for Edinburgh University. In retirement he will not be inactive. He is a member of the executive of the Scottish Council (Development and Industry), a member of the Western District Committee of the Scottish Board for Industry and a Governor of the Royal Technical College, Glasgow. Dr. McDavid was appointed a director of Scottish Agricultural Industries in the spring of this year.

Dr. W. J. Jenkins, who became Nobel Division chairman on 1st October, is a Welshman who has lived in Scotland for the major part of his long career in industry. He is a graduate of the University of Wales and a Research Scholar in Mathematics. He is also a graduate of London University and Bristol University. At Bristol he was a research worker in chemistry engaged by the Department of Scientific and Industrial Research.

Dr. Jenkins made his first contact with the explosives industry in 1915, when he accepted a post in H.M. Factory at Pembrey. There he met Dr. McDavid and began an association which was to last many years.

At the end of the first world war Dr. Jenkins undertook research at Oxford until 1920, when he came to Scotland and joined the staff at Ardeer Factory. Later he went to Bristol University for a year to do special research. On returning to Ardeer in 1922 he resumed a career which was to bring expanding experience in research, in production and in the higher management of the Nobel Division.

Dr. Jenkins was first appointed to the board of the Division in 1942, when his immediate responsibilities were partly with production and partly with the labour force employed. Three years later he was appointed a managing director with special interests in problems of productivity and the relations within industry. Recently he was made an alternate director to Sir Arthur Smout on the board of African Explosives and Chemical Industries Ltd.

Dr. Jenkins is an excellent speaker with wide knowledge of current affairs. He has a lively interest in Scotland and Scottish industry, and serves as a member of the Industrial Committee of the Scottish Council (Development and Industry) and the Chemical Sub-committee of the Scottish Council (Development and Industry). He is also a member of the Peat Committee for Scotland, a body convened by the Secretary of State for Scotland, and a member of the Council of the Glasgow and West of Scotland Management Association.

While he still lived in Saltcoats Dr. Jenkins was a member of the Saltcoats Town Council for several years, when his keen mind and lucid exposition of difficult problems were much valued. At the time of his resignation from the Council he was a magistrate.

Two other changes affecting members of the Division board



were made on 1st October. Dr. J. Taylor, M.B.E., Research Manager and a member of the board since 1945, has become one of the three managing directors, and Dr. D. Traill, a member of the Division board since 1948, is now Research Manager.

Three important changes were made earlier in the year. At the end of June Dr. A. G. White was appointed a managing director of the Division. Mr. O. R. Lineham, who has been Division Personnel Director since 1948, relinquished that post on 1st August to become Development Director, and Mr. L. Gale became Personnel Director on 1st August. His is the only new appointment to the board.

Visitors at 'Ardil' Factory

On 15th August the Secretary of State for Scotland, Mr. Hector McNeil, accompanied by Sir David Milne, Permanent Secretary, and other officials, visited the 'Ardil' protein fibre factory at Dumfries. The party was visiting Dumfries to discuss affairs with the local M.P., Major Niall MacPherson, before going on to Stranraer, where they joined the Fisheries Board ship for the annual cruise to the Western Isles.

Mr. McNeil was shown the new factory and was very impressed with the general scheme of its architecture. After visiting the plant members of the party went to the new showroom which was completed recently. Examples of all types of production made from 'Ardil' protein fibre were on view. Incidentally, the showroom is of the newest design, worked out between Nobel Division architects and display experts from a well-known firm of shopfitters.

Mr. McNeil was interested in the extraction of protein, since he thought that what he had seen at Dumfries would be useful during his subsequent tour to the Fishery Board factory in Scotland. Dr. J. W. McDavid, then Nobel Division chairman, was with the party, which was conducted round the factory by Dr. A. G. White, Dr. D. Traill and Dr. R. Campbell.

PAINTS DIVISION

I.C.I. Paints on "Comet" Airliner

The latest addition to be made to the British Overseas Airways Corporation airliner fleet, the de Havilland "Comet," is to be painted with I.C.I. paints. White-topped in Aero 'Du-Lite' and lined with 'Dulux' at B.O.A.C.'s specification, the "Comet" is the latest of their post-war airliners which have been painted in I.C.I. paints. The Vickers "Viscount," the Airspeed "Ambassador," and the Handley-Page "Marathon," airliners of the British European Airways' fleet, now to be known as the "Discovery," "Elizabethan" and "Clansman" classes respectively, are also painted with Aero 'Du-Lite' and 'Dulux.'

It has been scientifically proved that the use of a white paint on the upper part of an aircraft fuselage reduces the cabin temperature by 15° Fahrenheit, a most desirable factor when the aircraft is operating in the tropics. The choice of the correct type of white finish would also eliminate the necessity for polishing, thus effecting considerable economies.

Paints Division, together with other paint manufacturers, were approached to put up a lightweight durable finish against these requirements and offered Aero 'Du-Lite' for the white topping and 'Dulux' for lining and insignia. A B.O.A.C. "Argonaut" was finished in these materials, and after two and

a half months in Dakar, during which time the aircraft encountered everything from monsoons to blazing sun, it was returned to this country for examination. The paint film was intact and showed only a slight loss of gloss.

B.O.A.C. have now standardised in I.C.I. paints for the exterior finishing of their aircraft.

SALT DIVISION

The Radio Doctor

Dr. W. N. Leak, Salt Division medical officer, is this year's president of the South Lancashire and East Cheshire Branch of the British Medical Association. The British Medical Association exists for the furtherance of medical science and the development of medical practice, and we find that the area covered by Dr. Leak's presidency is one of the most populous in the Association.

We hear that Dr. Leak has been invited by the B.B.C. to prepare a script for translation into Spanish which will be broadcast to South America. Apparently Dr. Leak's broadcast is to be one of a series on British advances in medicine, and Winsford employees will be interested to know that it has some distant connection with the Adexolin capsules they used to receive during wartime.



WILTON WORKS

All the Thompsons work at Wilton

Mr. Sam Thompson, who is process foreman's clerk on the 'Perspex' Plant, now has his whole family working on Wilton Site. His wife, Mrs. A. L. Thompson, and daughter, Miss Joyce Thompson, are employed in the Piccadilly Restaurant. Stephen Thompson, the older son, is a fitter's mate on Wilton Construction, and his young brother Sam is a messenger at Plastics Division.

All the Thompson family are enthusiastic cyclists. Both Stephen and young Sam are keen racing cyclists and members



A recent photograph of the Thompson family

of the Cleveland Road Club, Middlesbrough. At present, Stephen, Joyce and young Sam cycle daily to and from work, a round trip of 16 miles, and shortly Mr. and Mrs. Thompson hope to make the same trip by tandem.

Sam Thompson, senior, is a keen member of the Social Activities Committee and a record-holding ticket-seller.

I.C.I. Man designs Billingham Coat of Arms

Mr. Duncan Watson of the Planning Section of the Central Workshops has recently been doing some planning for the Billingham Urban District Council.

Mr. Watson is a well-known local student of heraldry who has done many designs for various organisations, and when the Council decided that it was time Billingham had its own coat of arms, Mr. Watson was co-opted to the committee for his advice and guidance. Several drawings were made and submitted by him for the Council's approval, and the final choice, which has been granted by the Earl Marshal at the College of Heralds, is a combination of the Billingham family arms and the Bellasis family arms. John de Bellasis built his manor house at Billingham in the reign of William the Conqueror.

For a crest to the coat of arms an ancient ship was chosen to represent Billingham's connection with shipping, as Billingham must have been the lower port on the Tees long before Middlesbrough ever existed, and also due to the fact that it is expected at some future date that a start will be made to develop the seven miles of river frontage at Billingham. The word "Faith" chosen as a motto to the arms is self-explanatory, and it has been generally agreed that Mr. Watson has given Billingham a coat of arms which combines the early history of the town with the modern faith in its future development and civic dignity.

MAGADI SODA CO. LTD.

Lt.-Col. A. J. Pelling, D.S.O., M.C.

We announce with regret that Lt.-Col. A. J. Pelling died at Mombasa on 30th July.

Lt.-Col. Pelling was an M.Sc. (London), A.I.C., and Gold Medallist of the Chemical, Metallurgical and Mining Society of South Africa. After the 1914-18 war, in which he won the D.S.O. and the Military Cross, he was for about two years with Brunner, Mond & Co. Ltd. and then went to South Africa, where for six years he was lecturer in Physical Chemistry at the University of the Witwatersrand.

After a short period in business Lt.-Col. Pelling was appointed chief chemist of the Magadi Soda Co. Ltd. in 1928. He became general manager at Lake Magadi in 1931—a post which he held for ten years, until he retired in 1941. From 1941 to 1945 he was head of an East African Government body responsible for the development of local resources to meet the war-time shortages.

For the last few years he resided in Kenya Colony, but his activities were increasingly restricted by poor health. He was 58 at the time of his death.

NEW FEATURES FOR 1952

It is intended to introduce two new features into the Magazine, beginning with the January issue, which it is hoped will prove popular with readers.

The first is the reintroduction of four-colour printing, which had to be dropped for technical reasons when the Magazine was published at monthly instead of two-monthly intervals. The Kynoch Press are now able to undertake four-colour printing monthly, and the restoration of colour will be welcome. As from January next the front cover of the Magazine will be in full colour, and there will also be at least one feature illustrated with colour photographs.

Also beginning next January, the Magazine will carry a special supplement for correspondence, to be called "The Editor's Post Bag." This feature is being introduced as the result of a motion put forward at the Central Works Council in May, to liven up the pages of the Magazine with letters from readers. The difficulty of carrying correspondence in the Magazine has been that hitherto, before an issue is in the hands of readers, the succeeding issue has to be in the hands of the printers, thus making a two-monthly interval before a letter can be answered—a serious hindrance to lively correspondence. By having a special supplement which can be printed much later than the Magazine this time-lag can be largely overcome, and correspondence for "The Editor's Post Bag" will be welcomed up to the 17th of each month for publication in the following issue.

Publication of letters will, of course, be at the discretion of the Editor, who naturally hopes to receive a wide selection and to give readers as free a run as possible to say what they like, so that the "Post Bag" may constitute an entertaining and interesting addition to the Magazine. For the guidance of readers, however, a few tips may be welcomed. Letters should be as brief as possible and, of course, non-political. They should be upon subjects of general interest or concern to members of I.C.I., though they need not be by any means confined to purely Company topics. "Will a letter interest or stimulate other readers?" should be the main consideration. Letters, however, for publication in the "Post Bag" should not treat with subjects for which there is special machinery for dealing elsewhere, such as trade union matters, or matters which should properly be dealt with in Works Council. The Editor will have to exclude also letters the publication of which might damage the Company's good name or infringe security regulations; and in all questions of publication the Editor's decision will be final.

THE NOVEMBER MAGAZINE

The November issue sees the publication of an article which, in a way, is a companion piece to the one on the I.C.I. Farms last month. The article reveals the inside story of the research work which the Company is pioneering into the conservation of game—notably the partridge and the pheasant. It is a fascinating story, in which the scientist learns from the lore of the gamekeeper and the gamekeeper from the scientist.

Our other Company article has some fine action studies of the Coopers' Shop at the Huddersfield Works of Dyestuffs Division, where the ancient craft of cooperage is practised by families born and bred to the trade over generations. The remaining two articles are on subjects far apart—food and the stratosphere. Mr. Henry Sarson writes on the origins of soup-making and Mr. Gordon Begg on the polythene balloons which carry instruments to record conditions eighteen miles up in the sky.



Underground Adventures

By R. M. Wallis (General Chemicals)

There is a new race of adventurers in Britain today—the explorers of underground caverns, who are known as cavers or pot-holers. Here Mr. R. M. Wallis, himself an enthusiastic caver, tells of the fascination which these explorations command.

PROBABLY a good many of you have visited one or other of the various show caves which are open to the public up and down the country, so that you will know the sort of things which are to be seen underground. But nature keeps the best of her underground charms more deeply hidden. Hence that strange race, cavers.

Caves have always attracted and awed people, and numerous accounts of early descents can be found. Eldon Hole in Derbyshire held a particular fascination, and local landowners often let their tenants down on ropes to plumb its depths.

Another well-known cave, Lamb Leer in Somerset, was visited by J. Beaumont in 1681, and his account is remarkable for its accuracy, so much so that present-day explorers spend a good deal of time and effort in looking for one of the chambers he described which has since been lost. The Great

Chamber in Lamb Leer is an impressive sight, and the 70 ft. rope-ladder climb down the wall is as good as can be found in Somerset—assuming you like rope ladders. The sight of a long swinging ladder disappearing into the blackness of an abyss is quite enough to scare many people off caving for good, but in point of fact ladder-climbing is neither difficult nor dangerous, though it may be tiring and unpleasant, especially when there is a waterfall by the ladder. My memories of wet ladders are vivid, as are most people's.

Perhaps a description of a trip which I made with a party of friends some years ago will serve to show some of the more unpleasant parts of caving. Gaping Ghyll opens in the middle of a moor and falls 360 ft. sheer to the floor of a vast chamber. By following devious small passages one may eventually regain the light of day via another cave.



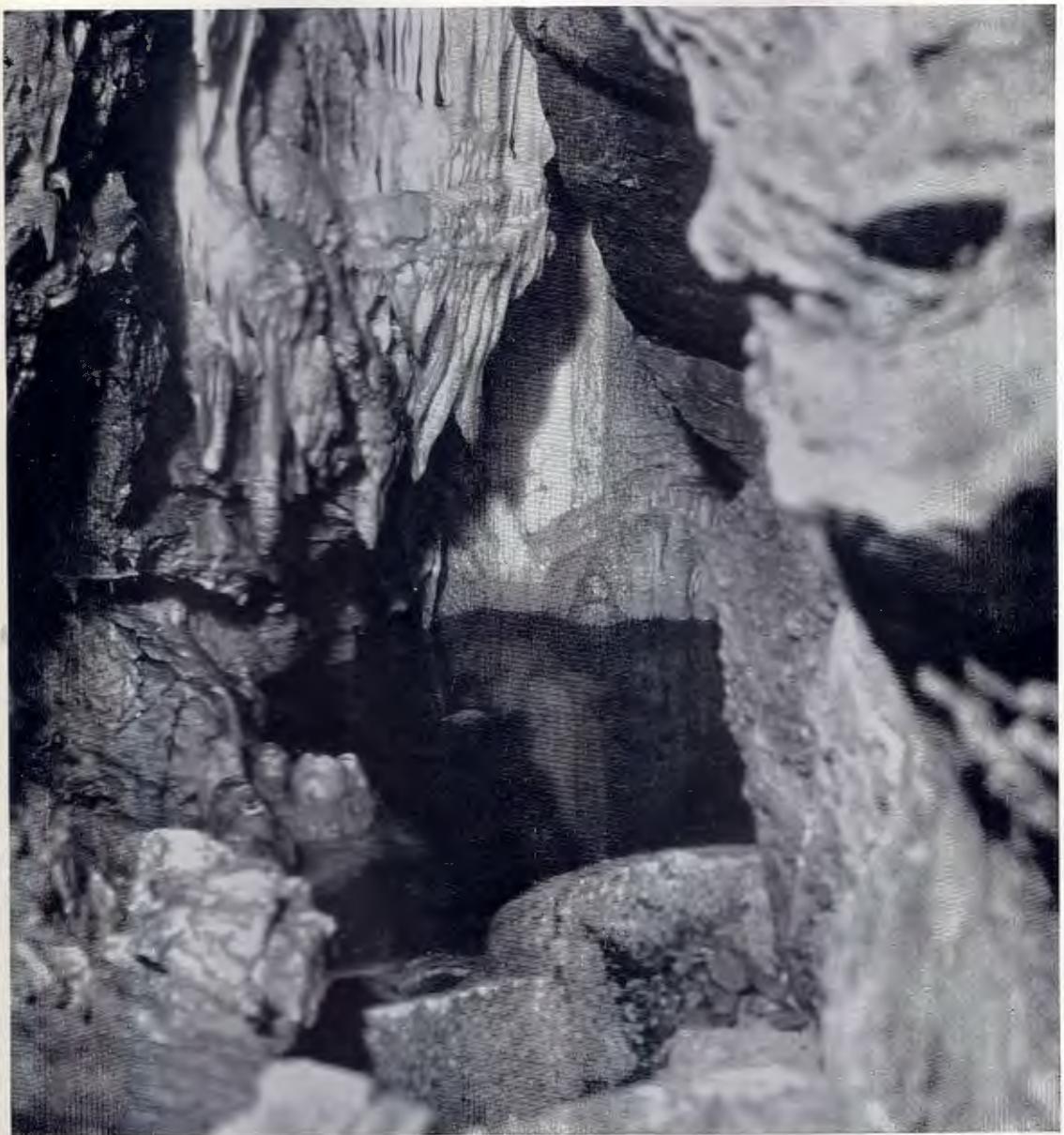
STALACTITES ARE THE BEAUTY which rewards the caver, just as the view from a mountain top rewards the climber. This remarkable photograph was taken by the author with a 120 Kodak camera.

We began the expedition by being dropped, each in turn, down the hole with the aid of a winch, and we then set out along the crawl known as Hensler's Passage. This is about a quarter of a mile long and averages about eighteen inches in height. Water has cut the floor into ripples such as may be seen on a sandy beach. In rock they are most trying to the more bony parts of the body.

We had been told that Hensler's had only a few pools. This was probably true enough, but we chose to explore it just after

a flood, so that the pools had joined up in long lengths. Furthermore, six inches of water in a passage twelve inches high does not leave very much room. We got very wet, and underground water is peculiarly cold. But even a quarter of a mile of this does not last for ever, and we emerged into a chamber where we decided it was time for lunch. Our bread was rather the worse for wear, so we were obliged to eat butter and pilchards off very muddy hands.

During lunch a waterfall complete with rope ladder in its



WATER IS THE ~~ENEMY~~ of ~~underground~~ adventure. When the roof of the cave dips below the water this is known as a "trap." If the underwater stretch is long, then divers supplied by the Cave Diving Group are called in for further exploration.

midst had been leering at us. Up we had to go—a matter of fifty extremely wet feet. I had a feeling the whole way up that I was unable to breathe, as I seemed to be totally immersed all the time. The others found the same. The remainder of this ~~underground~~ journey alternated between similar waterfalls and an extremely narrow winding rift where one needed to turn sideways to get through. We were very glad to get out after four hours, having covered only three hundred yards as the ~~crow flies~~.

Water is not much appreciated by the average caver, particularly when intimate contact with it is necessary. Still less appreciated is that ~~institution~~ known as a "Trap," when the roof dips beneath the water. For myself I have only sampled one, in Stoke Lane Swallet in Somerset. This one is only about two feet long and is ~~worth~~ the wetting, but there are plenty more for those who like them—and some people seem to. Of course, if the ~~underwater~~ stretch is too long it makes an

effectual bar to further progress and divers are needed for further exploration. These are supplied by the Cave Diving Group whose exploits in Wookey Hole have from time to time been reported in the press. Equipped with modified "Frogman" suits they can spend a considerable time under water and explore completely submerged parts of a cave where the normal caver cannot hope to go.

The total darkness of a cave means that the caver must take his own light. Electric torches, acetylene lamps, candles and all manner of devices are used, generally carried on the caver's helmet so as to leave his hands free. Furious arguments can be aroused on the question of the best type of lamp. On one thing only is everyone agreed, that it must be reliable (though one would hardly think this from the Heath Robinson contraptions some people

use). Luckily I have not yet been left lightless in a cave and hope I never shall be, for unless one knows every foot of the way the only thing to do is to sit and wait for a rescue party—usually a long and chilly business.

I have no doubt that by now you are thinking that all cavers must be incurably mad. We should be at least rather peculiar if that was all there was to it. But the mountaineer gets a joy out of pitting his skill against the rock, and the caver can do the same. The climber, if it is not misty, can get a view from the top of the mountain and the caver gets the stalactites, which can be as lovely a sight as any view. But caving trips are not made merely for sightseeing. From photography to entomology you can carry your hobby underground. The reasons for caving are probably as numerous as the number of cavers and at least as individual. We may be few in number compared to the followers of other sports but we like to think we are select—until, literally, we come back to earth.



Above ground at the anhydrite mine

(Billingham Division Photograph)